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PAGE 52

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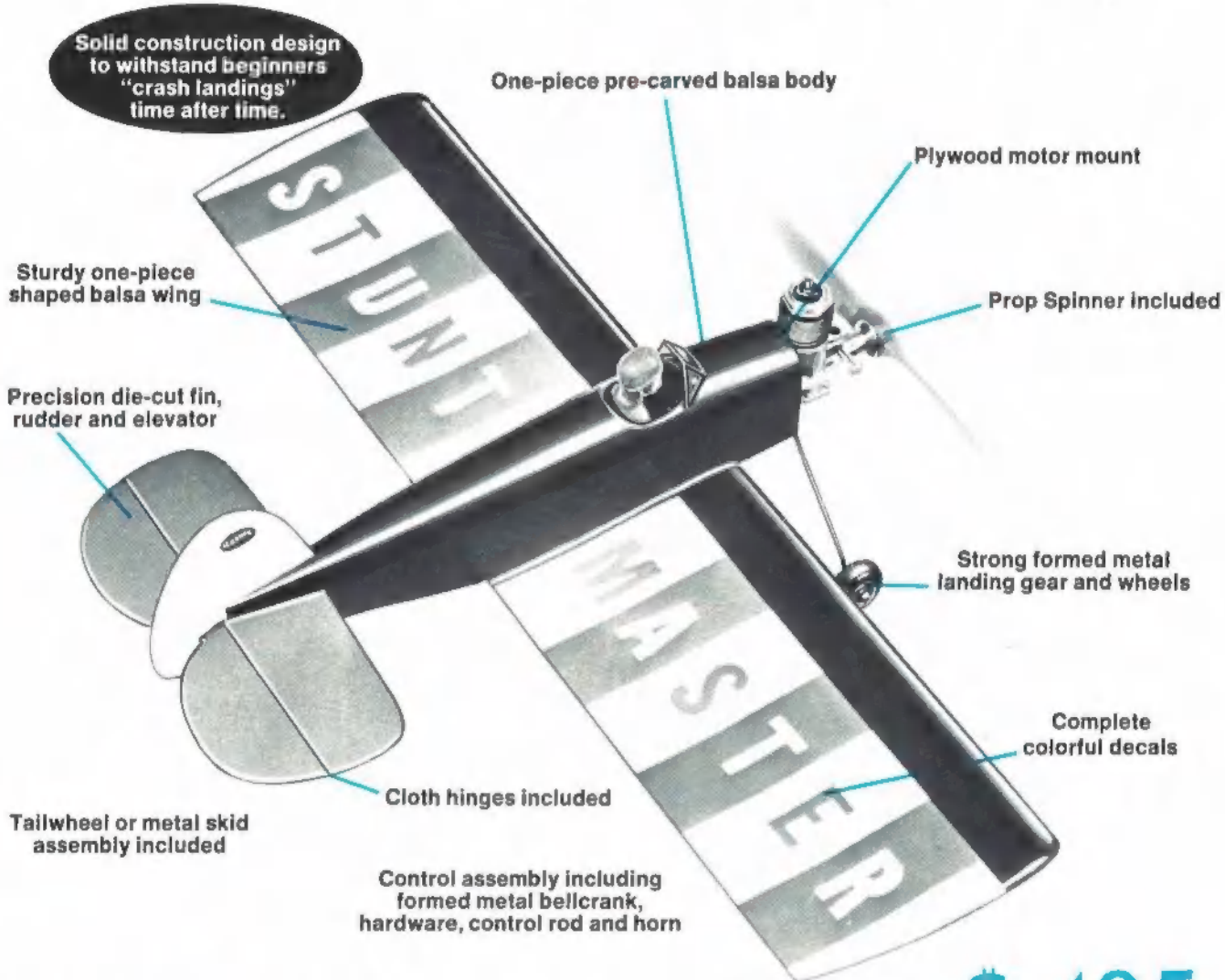

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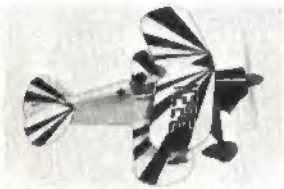
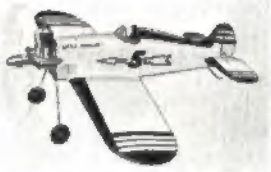


Kit 20 **LITTLE STINKER**, 18". Popular aerobatic speedster.



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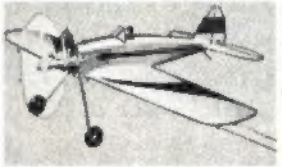

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AMERICAN aircraft modeler

COVER PHOTO

Monty Groves' photo of his 40-powered replica of the first Lockheed airplane. At the time of the original's design, the company was known as Loughead Aircraft. It is an unusual biplane and an excellent flyer. See pages 40 through 47 for the story.

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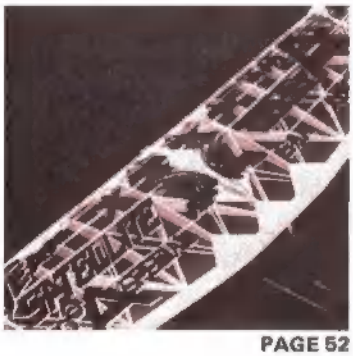
PAGE 48



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ARTICLES

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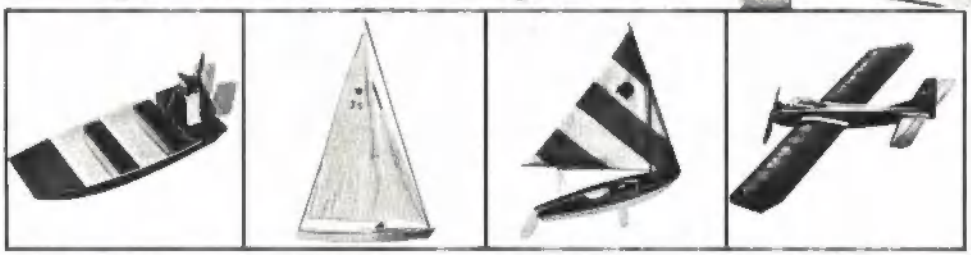

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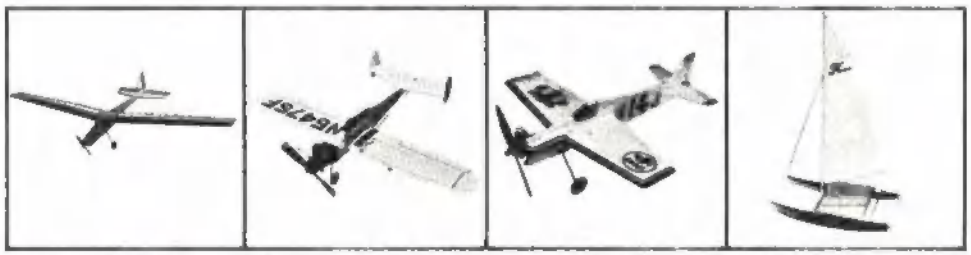

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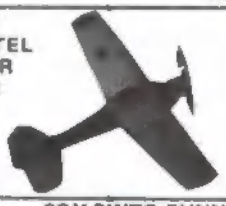

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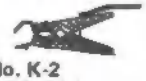

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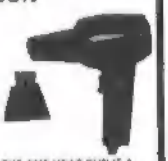

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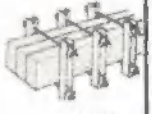

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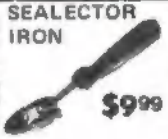

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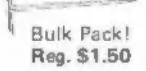

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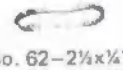

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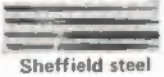

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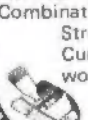

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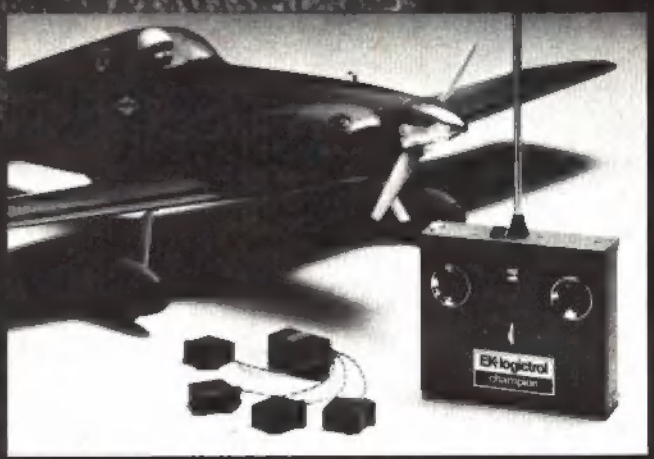

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Modeler Mail

Wants variation in design

I am a tenderfoot in Radio Control and am also quite adept in Control Line and Free Flight. I often read the "Where the Action Is" section in your magazine; after finishing with the Pylon Racing column, I am left with the impression that this aspect of modeling must be rather dull with respect to design. It seems that almost all the planes have different names, but generally look alike. I am of the opinion that if the experts are as good as they are presented in your magazine, they should be able to come up with a totally new design that would perform just as well, if not better than, the other conventional planes and still be legal to fly in competition. I realize that there may not be many subjects that will perform satisfactorily, but planes that almost all look alike really turn me off. They might have different finishes, but they still are the same basic design. I feel this probably holds true for Pattern ships also. I am presently a Scale fan, but build other types as well.

John Pribble, Burnsville, Minn.

Plea from Ft. Leavenworth

Modelers have been described as everything from purists to nonconformists. But the dedicated hobbyist still holds a distinct place in our society. What I will do is attempt to show the vastness of this syndrome—the small engine jockey.

There exists within the confines of the U.S. Military Discipline Barracks at Fort Leavenworth, Kansas, what we consider to be the most dedicated, most resolute, and probably the most frustrated fraternity of modelers in hobbydom. We number about eight now; our interests are varied, however, each is tremendously dependent upon his fellow modeler.

Examples of comradship should exist everywhere as it does here. The men accumulate the necessary parts and equipment in ways that would bring tears to the average builder. Kits are predominately purchased by interested parents, but remain scarce. One of the methods is our system of converting the applicable plans from AAM into aircraft. We first make a complete set of full-scale drawings in order that they may be reused. Then we assemble the components needed and usually combine old kits (leftover balsa and hardwood), eventually fabricating our own materials. Fuel tanks are made of the sheet metal from one-gallon modelers' fuel cans. Brass tubing comes from expended ballpoint pen cartridges.

We are currently finishing a strange melange of aircraft. In process is a scale Spitfire, two Voodoos, an F4U, a Contender and just recently a Vertigo by Ian Barrett (September 1972 AAM).

There exists an impressive array of aircraft—a P51 Mustang, a Shoestring, a 62' Cessna, a Sr. Falcon, a scale Cessna, a 36" hydroplane, two Jr. Combat ships, a Jr. Falcon and an RC racing Dodge Charger.

All of these models were acquired over a great length of time and at the expense of relatives and friends. These people cared and we love them for it.

Probably the most outstanding record we can claim is our aircraft attrition rate. Only one aircraft damaged in the last year. This while taxiing. You see, *we aren't allowed to fly them!*

We at this institution have formulated a desire and achieved a degree of professionalism in this challenging endeavor. Now it remains a question as to our ability to carry on. The problems are slowly being resolved through teamwork and keen interest. But there remains the ever-present lack of equipment and accessories (glue is gold here!). In order to continue, we solicite the aid of understanding individuals in the hope that as we make a place for ourselves, we can continue to foster hope from the outside.

Your magazine is a constant source of enjoyment (when we can get it), and we profoundly congratulate the work you are doing.

Lt. Richard Jacobs USAR, Drawer 'A', Fort Leavenworth, Kansas 66027

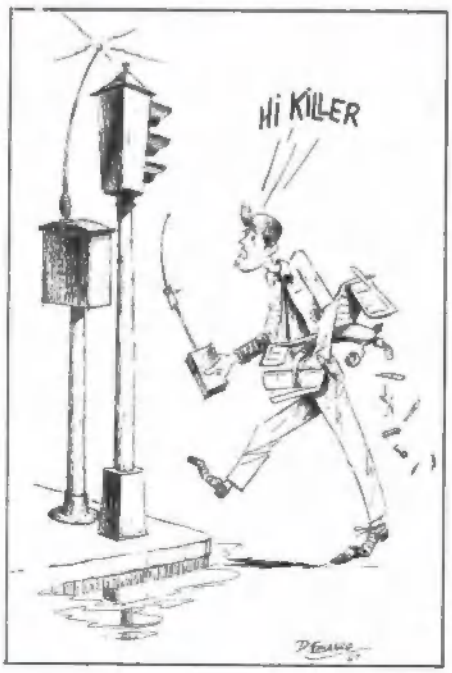
In Appreciation

I would like to thank **American Aircraft Modeler** for donating the trophy which I won for first place in the Speed Task, Standard Class, at the '72 Soaring Nats in Chicago. It's a good feeling to know that RC Soaring has the support of the finest modelers' magazine available.

Bob Pell, Farmington, Mich.

Thank you for saying thank you.

—Publisher.



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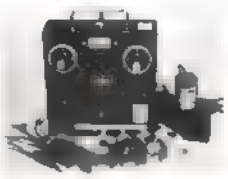
$166.00



Incredible as it may seem, you can now buy the 6 CHANNEL semi-kit at a discount of nearly $100 off of its list price! This $166 price for a 6 CHANNEL semi-kit is actually cheaper than our previous price ▬ the four channel semi-kit.

Please order quickly because even though this offer is being made during what is ▪ somewhat slack time for radio sales, it is quite possible that demand could outrun supply at this extremely low price.

Outfit includes semi-kits for transmitter, receiver-decoder, ▮ servos, all n-cads, charger, factory warranty ▬ all factory assembled P/C boards. Your choice of 27 or 72 mhz. frequencies.

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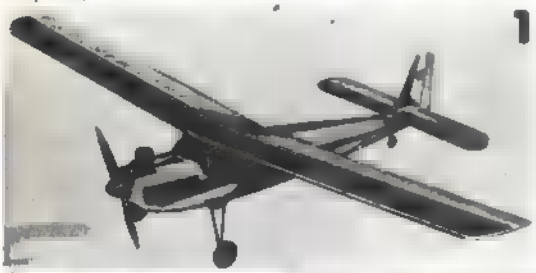
You may pay more money for a radio, but you may not get as good a radio.

NEW!

3 UNUSUAL "Change of Pace" KITS FROM GERMANY.....

These kits, while well known in Europe, have been unavailable in this country for the simple reason that their prices are too high to permit dealer and distributor markups. Hobby Lobby is importing these directly for retail sales which is the only way a low retail price can be put on these kits. For example, the Senior Telemaster would ordinarily have ▬ sell for nearly $100, but by being sold directly to you we can sell it for half that price. Anyway — read on, because these are very unusual kits in many different respects.

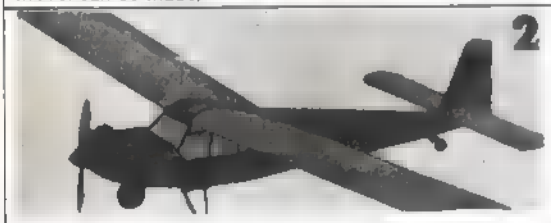


1

NEW! SENIOR TELEMASTER

$49.95

With nearly an 8 FOOT SPAN this airplane is the largest RC model kit we know of. 95" wing span. This plane is ▬ gentle that it'll fly rudder-only. Of course, it ▪ intended for 4 channels and has ailerons. It uses ▪ .40-.60 size engine which ▪ plenty of engine for ▪ plane that has such ▪ huge lifting capability. This RC plane has been used in Germany to string cables over valleys, for aerial photography, and RC glider towing. Construction is conventional and uncomplicated. Sufficient nylon covering material is included to make the SENIOR TELEMASTER as indestructable as an RC model can be made.

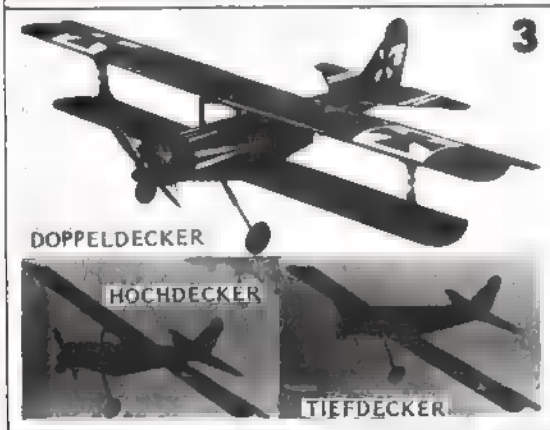


2

NEW! TELEMASTER

$34.95

If the Senior Telemaster is just a bit too big for you, the identical, but smaller 71" span TELEMASTER may be your cup of tea. For .30 to .60 engines this ▮ channel plane ▪ nearly as much of a delight ▬ its big brother.



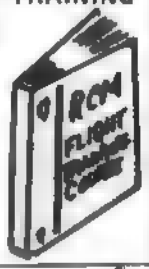
3

NEW! RED EAGLE' (3-in-1 Kit)

$49.95

The German ▬ for this 3 in 1 kit is 'ROTER ADLER.' You can build ▪ as a "Doppeldecker," "Hochdecker," or "Tiefdecker." The large top wing is 60" and the smaller lower wing is 51".—pretty large for a biplane, but this kit can be built whichever way you want, and can be converted to one of the other types later. Construction is kept VERY simple Engine size: .40 to .60. Vintage German decals and aileron and tail surface design give RED EAGLE that World War I look.

RC Modeler Magazine FLIGHT TRAINING COURSE $10.00



Over 200 pages, 300 photos, covering every phase of radio control for the beginner and sport flyer. It begins with the basic fundamentals of radio control and takes the individual through construction, radio installation, theory of flight, all the way up to the actual flying of his first RC aircraft.

NEW! RCM BASIC TRAINER
50" span, 2, 3, or 4 channels
and
McCoy 19 ▮▮ Engine
Total List value $50.90
Special $37.99

1/4 MIDGET RACING KITS

Prices ▬ effect until Sept. 30, 1972

NEW! Dee Bee MIRAGE 42 A-R-F
List Price $42.95
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Semi-scale plastic ARF of the 1949 Midget Racer. Hard wing skin, hinge slots molded in, keyed-in tail group. Optional wing area: 300 sq. in. or 356 sq. in. - build it either way.

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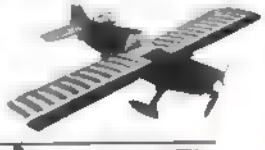
Conventional balsa construction semi-scale kit of famous racer. 300 sq. in. wing.



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FIFTY-FIRST IN A SERIES

getting started in R/C

JIM McNERNEY

CHOOSING A RADIO PART II

Last month we discussed some of the more significant parameters which determine radio performance. We will now list a few of these, the units of measure and the relative "goodness" of high or low values, then we'll discuss some of the other considerations in buying a radio.

I recently received a letter from a reader who asked, "What radio would you buy?" As I explained to him, my desires or requirements for RC as well as my ability to acquire a radio may differ greatly from his. When you contemplate spending up to a thousand dollars on RC, you should choose your equipment as carefully as you choose a car or a house—or maybe even a wife. There is much that should go into your determination of the most suitable radio for you.

In our first article we discussed the consideration of complexity, i.e., how many functions do you need, or think you'll need? Other questions to be answered are: How dedicated are you to the hobby? How much do you want to invest? Are you right- or left-handed? Do you have a physical disability which restricts finger, hand, or [illegible] movement? Unfortunately the RC fraternity has [illegible] pro shops that can custom fit you to an RC outfit, but clubs and hobby shops can help. My whole point is that you shouldn't blindly accept the word of the first guy you meet—including me.

The following are a few of the parameters we discussed last month and an idea of how to compare system values of various radios:

Parameter	Units	Best Value
System Resolution	degrees or percent	smaller
Transmitter Output	watts	larger
Receiver Sensitivity	millivolts/microvolts	smaller
Image Rejection	decibels	larger
Harmonir Rejection	decibels	larger
Servo Transit Time	sec.	lower
Servo Thrust (Torque)	lbs. in.	higher
Airborne System Power Consumption	watts amps/hour	lower lower
Temperature Range	°F	at least 0°-150°F

There are no industry standards for these values, but the information is, or should be, available from most manufacturers. Other criteria which will influence your decision to buy a specific radio are cost, size, weight and intended use. There is no way for these considerations to be pre-determined for you. It is not necessarily true that all expensive radios are good and all cheap ones bad.

Another problem is that the parameters listed are engineering specifications verified on specific test units. Unless the manufacturer runs stringent production tests for each unit, you have no assurance that your radio will perform to those specifications. The average RCer has no facilities available to verify system performance. This is where the manufacturer's reputation comes in: if he is known for his system reliability or for conservatively rating his equipment, chances are you have nothing to worry about. Also, the reviews of radios conducted by various publications are generally performed by objective people on production units which are picked at random. The performance data in these reports can generally be considered representative.

This is all well and good, but the fact remains that even General Motors produces an occasional lemon. Radio manufacturers are subject to the same problems as any mass production company experiences. System design changes, changes in personnel, production techniques or location, even a hungover assembler, can wreak havoc with the final product. A company which has maintained an unsullied reputation for years can lose its following overnight through one bad run of radios. The RC community is very fickle. Popularity of a given system, initially at least, is based as much on who flies it as on how well it performs. Granted, the expert is more aware of the shortcomings of the radio than the novice or sport flier, but the expert is also more capable of compensating for these shortcomings. So, you can read a lot on the subject of radio choice, you can, and should, seek the advice of other people, but the choice is ultimately your own. We can only provide a few pointers to reduce your chances of making an expensive error.

While on the subject of industry standards, there are none for sequence of control functions, component connectors, master/trainer systems, voltages or charging rates, output pulse width or directions. The only generally agreed "standards" are the "modes" of aircraft control, (i.e., mode I is aileron, throttle on right stick, mode II is aileron, elevator on right stick) and the frequencies used to control RC models. If you own a radio with master/trainer function built by one manufacturer, it is compatible only with another master/trainer radio system from the same manufacturer and probably only one built the same year as yours.

Perhaps the hobby industry associations will recognize the need for standards and adopt them at some future date. Meanwhile you'll have to live with the present haphazard system. To alleviate incompatibility and also depending on local experience and availability of service, you will generally find one or two brands of radio will predominate at a given flying site.

Next Month—The Care and Feeding of RC Systems.

CARL GOLDBERG

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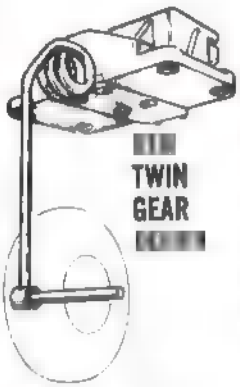
NEW! 1972 MODEL CG RETRACTS



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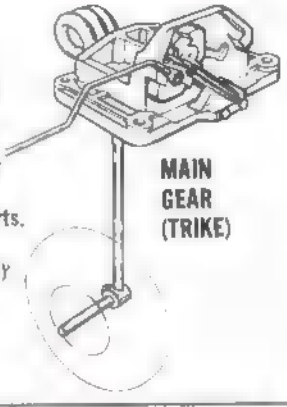

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When you want a SAFE link . . . ask for SNAP-LINK!
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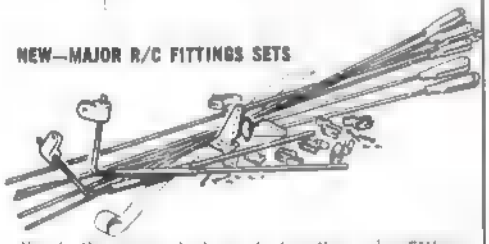
NEW—MAJOR R/C FITTINGS SETS



Here's the economical way to buy the major fittings for your multi-ship. In one set, you get all the horns, links, keepers, bellcranks, or strip aileron linkage, and hinge material—and at a saving.
R/C Fittings Set No. 1 for ship with standard ailerons—$3.50
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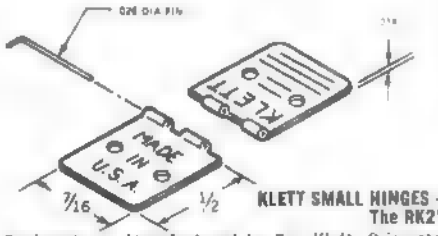

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Hardened steel collar and screw—75¢.

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Our new horns have the upright part rising from the center of the base for maximum stability. Holes are right for ⅛" wire; nut plate for simplest mounting. Long horns or short horns, with screws—50¢ for 2.

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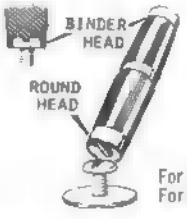

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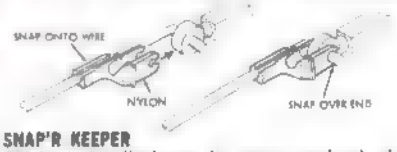
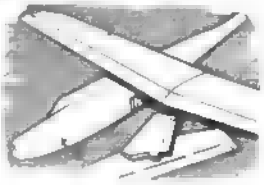
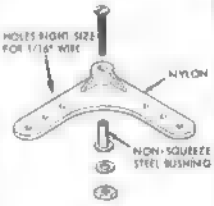
For ¼" Nylon Screws } 98¢ each.
For #10 Nylon Screws }



SNAP'R KEEPER
Quickest, handiest way to secure pushrod wire end to servos, horns, etc. Works on wire ¾₄ to ¾₂" diameter—50¢ for 4.

REPLACEMENT FOAM WINGS, ETC.
To with your own design fuselage. Proven efficient Ranger 42 foam wing gets you in the air quickly — $3.95. Stab and vertical fin, set $1.95. Assembled Ranger 42 fuselage, plus bearers, nosegear, etc., $9.95.





AILERON BELLCRANK
Bellcrank has steel bushing of proper size, so crank can be screwed firmly in place without binding. No electrical noise—all metal parts are screwed tightly together—50¢ for 2.

½A BELLCRANK and
Made of nylon, this new set provides smooth ½A control line operation. Easy on dacron lines, too —25¢.

SHEET METAL SCREWS
Like wood screws, but better. Sharp, clean, full-depth threads, hard and strong. Excellent for mounting servos, etc. Includes washers—#2 x ⅜—30¢ for 10; #4 x ⅜—30¢ for 8.

P.S. For best service, see your dealer for items you want. If not available, write direct; add 35¢ per item (75¢ outside U.S.). Minimum order $1.

MANUFACTURERS—All our accessories available at excellent O.E.M. bulk prices.

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I am sending 20¢ for 8 pg. illustrated Catalog with "Recommendations in Starting in R/C," Basic Explanation of R/C Equipment, and Radio Control Definitions.

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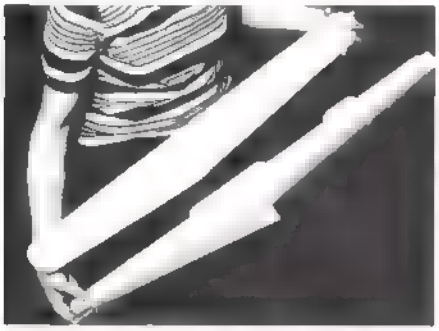
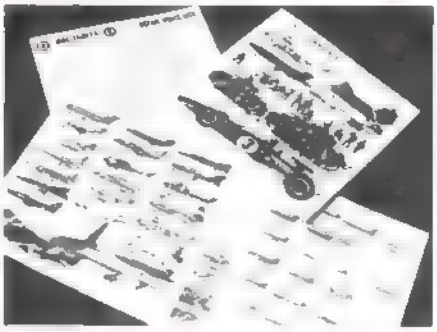
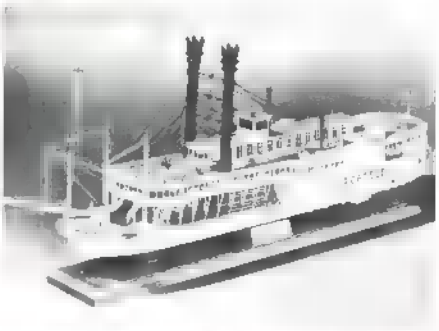
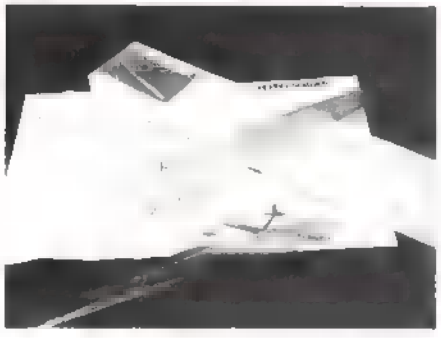
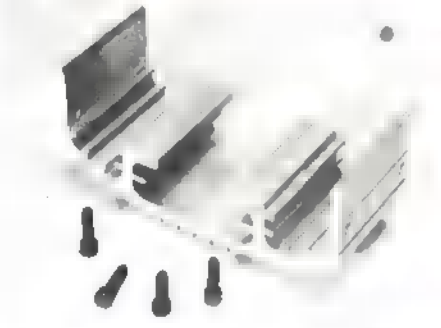
New Products Check List

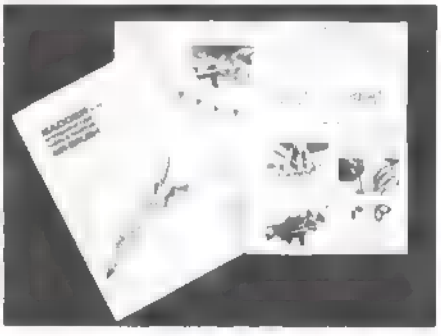












Gee Bee/Mk IV floats. Ready-to-paint floats are 33" long, lightweight blow-molded plastic, operate from water, snow and sand equally well. Can be attached to aircraft in three minutes using spreader bars and nuts supplied with kit. Provisions for attaching sub-rudder. Additional [illegible] forthcoming. $19.95. The Gee Bee Line, 143 E. Main St., Chicopee, Mass. 01020

Dumas/Hi-Pro Soarer. Lightweight molded fiberglass fuselage in two pieces, built-up balsa wing has 101" span, high aspect ratio for spectacular soaring. For thermal flying on two channels, Hi-Pro has flying weight of 38 to 42 oz., wing area of 650 sq. in. $39.95. Dumas Products Inc., 790 S. Park Ave., Tucson, Ariz. 85719

Octura Models/Marine Engine mounts. Third in a series of extruded aluminum mounts. Designed for 40 through 65 engines. Integral fins provide extra engine cooling, acting [illegible] heat sink. 5" wide, 7.5 oz. Mounting hardware included. $6.45. Octura Models, Box 536, Park Ridge, Ill. 60068

MRC/Encyclopedia-Catalog. The thing in catalogs today is to make them big, beautiful and informative, [illegible] well [illegible] display of manufacturers' wares--and MRC has come through with a beauty. Their *Tamiya* line of precision plastic kits are displayed in quality multi-colored printing, beautiful black-and-white photos, lots of supporting detail [illegible] text. Autos, armor, cycles, aircraft all featured in this outstanding scale line of equipment. 50 cents. Model Rectifier Corp., 2500 Woodbridge Ave., Edison, N.J. 08817

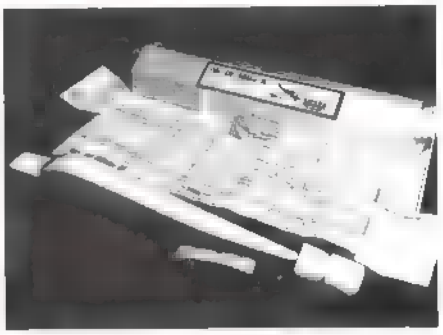
Hobby Lobby/'72 catalog. One of the price leaders in the industry displays its '72 line in 77 pages of text and illustrations of RC equipment, engines, kits, [illegible]. Text consists not merely of manufacturer's verbatim ad copy but the real word from Jim Martin of Hobby Lobby who tells the hobbyist what he really needs to know. Lots of additional good advice, insights. $2. Hobby Lobby International, Rt. 3, Franklin Pike Circle, Brentwood, Tenn. 37027

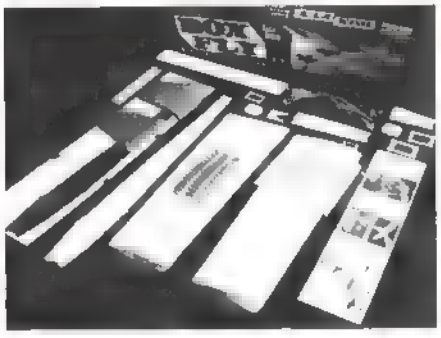
Dynamic/Fuel Bulb. Made of fuel-resistant vinyl construction which will not decompose and flake off from inside. Why contaminate your fuel with little flecks of rubber from a standard syringe? With brass needle, $1.29. Dynamic Models, 13309 Saticoy St., N. Hollywood, Calif. 91605

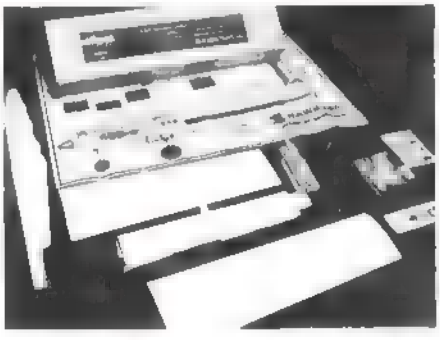
Scientific/Side Wheeler. Beautiful museum-quality model of Robert E. Lee, fastest steamboat on the Mississippi in the 1870s. Super-detailed formed deck railing, pendant material, mounting base, nameplate. 24½" long, $32.95 at your hobby dealer. Scientific Models Inc., 340 Snyder Ave., Berkeley Hts., N.J. 07922

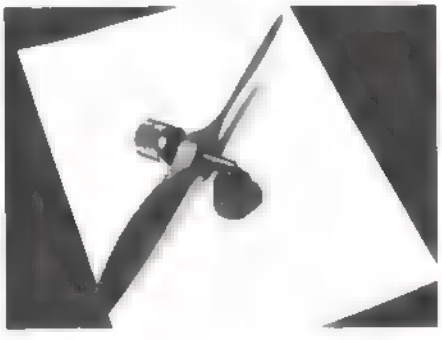
Jerobee/Cox RC conversion kit. Add RC to your Cox Baja Bug or Dune Buggy in 15 minutes. Template shows location of Jerobee brick-type receiver. Linkage is pre-bent to facilitate installation. Available in two forms, linkage only for people with own RC gear, and linkage plus Jerobee transmitter and receiver. $84.50 with radio, $1.49 without. Jerobee Industries Inc., 12702A N.E. 124th St., Kirkland, Wash. 98033

Badger/Airbrush techniques. A valuable book for the scale modeler. Covers techniques, special effects as well as general information on airbrushing with the Badger airbrush. 50 cents at Badger outlets or order directly from Badger Airbrush Co., AM Div., 9201 Gage Ave., Franklin Park, Ill. 60131









Reynolds/12-meter sailboat. Now available with Black-design deck; in fiberglass, ready for sail, rudder, ballast. Available in any stage of completion from $41.65 and up. 58¾" length. For complete details send stamped return envelope to Reynolds Mfg. Co., 3010 Chris La., Orlando, Fla. 32806

World Engines/Pre-fab trainer. *Box-Fly* by Pilot is an unusual kit which is a natural for a beginner or anyone else who wants a high-quality easy-to-build airplane. Plastic-covered foam wings, slab-sided fuselage, all wooden parts pop out cleanly and neatly with no need for further handwork. High 52" wing, for one to three channels, 19 to 25 power recommended. Flying weight 3 to 3½ lbs. Detailed instructions, beautiful packaging. $29.95.
Also: *Hawk 460*. New high-performance low-wing plane uses foam fuselage which is reinforced with plywood at firewall and underside for light weight plus strength and repairability. Foam wing is reinforced with wooden spars and wood-encased bottom. Result is optionally rugged but easily built aircraft. 52" span, 460 sq. in., 33" length, weighs just over four lb. with four-channel gear and 19 to 40 power. With decals and hardware. $24.95. World Engines Inc., 8960 Rossash Ave., Cincinnati, Ohio 45236

Sterling/Great Lakes Trainer. For CL flying with an extra measure of interest and visual appeal, this classic 1930s era biplane trainer fills the bill. Kit contains covering material, plastic cowl, engine mounts, hardware pack, shaped and notched balsa and plywood parts. Scale, 1¼":1', 36" span, 26½" length, recommended for 19 to 35 power. $14.95. Sterling Models, Belfield Ave. and Wister St., Philadelphia, Penn. 19144

The Squadron Shops/More for the scale modeler. In addition to detailed publications in the aviation field, Squadron Shops also provide technical data on almost anything else which the scale modeler may wish to build. Squadron/Signal publication shown is typical. Detailed book covers single example of German armored infantry carrier, provides extensive text and many action photographs. $3.95. Write Squadron Shops, 23500 John R, Hazel Park, Mich. 48030

Rom-Air/Prop facer. A unique tool which will eliminate a large potential source of vibration in your engine, add smooth rpm's to the top end of power range. Prop hub face must be at exactly 90° to axial hole for true running; *Tru-Prop* rectifies hub face with precision sandpaper-faced collars. Built to precision tolerances, pointed ends of shaft allow use as a prop balancer as well as hub facer. $5.95. Rom-Air International, Inc., 924-65 St., Brooklyn, N.Y. 11219

Hot Line Models/Sierra Trainer. Large low-wing Beechcraft cabin ship flies on three- to six-channel RC with 40 to 60 power. Unusual slab-sided lower fuselage combines with plastic cowling and fuselage top. Pre-cut and finished ribs, span 67", area 670 sq. in., weight 5½ to 6 lbs. With hardware. $44.95. Hot Line Models Inc., 208 N. Taylor St., Amarillo, Tex. 79109

Sig/Stinson L-5. 1" scale Stinson observation plane designed as a large (34" span) rubber-powered near-scale kit with excellent flying qualities. Can be easily converted to .020 power for free flight. Simple, strong construction, $4.95. Sig Mfg. Co., 401 S. Front St., Montezuma, Iowa 50171

K&B/Veco muffler. For the 19R/C series 71 engines, muffler is billed as providing maximum quieting while maintaining high performance inherent in Veco design. $6.95. K&B Manufacturing, 12152 Woodruff Ave., Downey, Calif. 90241

ON THE SCENE

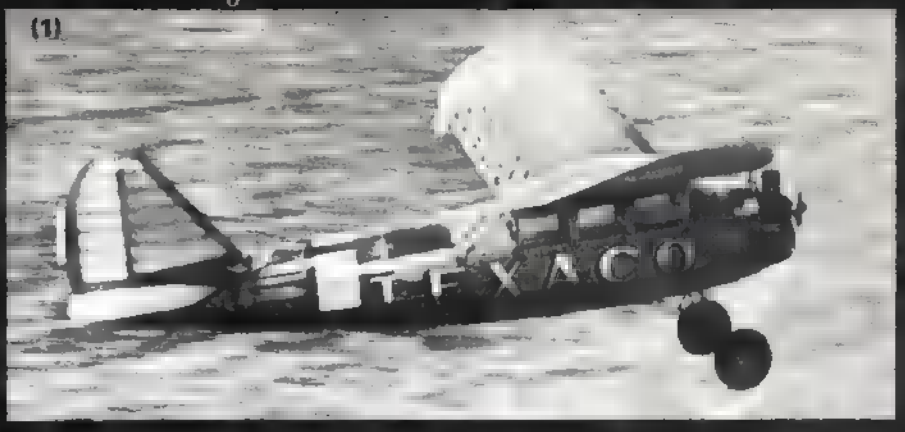
Texaco Old Timer Meet

ROBERT ANGEL

[illegible] arrive scared a jack-[illegible]. It [illegible] the only man-made object on [illegible] several miles [illegible] south and west a [illegible] of hills broke [illegible] desert. [illegible] ice [illegible] with activity [illegible] the friendliest, [illegible] re-laxed [illegible] have ever [illegible] proceeded.

The [illegible] event, as [illegible] to-[illegible] has remained virtually unchanged since [illegible]. All [illegible] designs used must have [illegible] signed and flown [illegible] January [illegible] 1939. [illegible] must be gasoline-i[illegible] type. [illegible] maxi-mum engine size [illegible] "stretched" by agreement for this particular contest [illegible] allow a [illegible] enter. The engine run is limited only by a [illegible] amount [illegible] fuel, at [illegible] oz. [illegible] total [illegible] weight, up to 1¾ oz. maximum. [illegible] time [illegible] release [illegible] the ground until [illegible] out-of-[illegible]. First place winner R.B. [illegible] ship after one hour and [illegible] diligent chase by motorcycle.

This AMA sanctioned and SAM [illegible] Antique [illegible] sored [illegible] late in [illegible] near [illegible]. The season [illegible] for [illegible] occured in April—same site [illegible] rules.

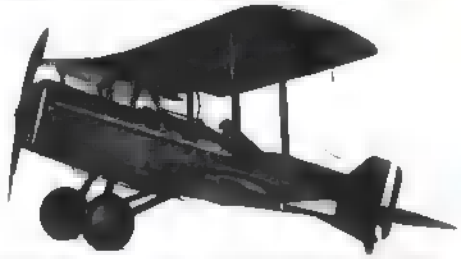


(1) Big old Bucaneer, suitably labeled [illegible], built [illegible] won [illegible] nephe-[illegible]ds the Roll [illegible] CD Bruce Chandler to inject mea-sured amount [illegible] the Mighty Midjet. (3) This impressive bird, held aloft by Cliff Silv[illegible] powered b[illegible] Bunch Mighty Midjet; it placed fourth [illegible] 27:52. [illegible] Phil Bernhardt [illegible] King. [illegible] Gordon [illegible] [illegible]yers Society (SCIPS). Inverted O & R 60 SV powers Fiske Hanley. Design won the 1937 Detroit Texaco event. [illegible] Almost half the airplanes, if not half the contestants managed [illegible] get lined up. Leo Holland, far right, [illegible] second. Sal Taibi, [illegible] to Leo, [illegible] the original old-time designer of several ships [illegible] the contest.

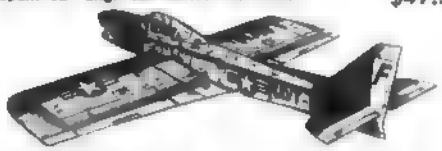
Photos [illegible] Antioch

R/C MULTI CHANNEL

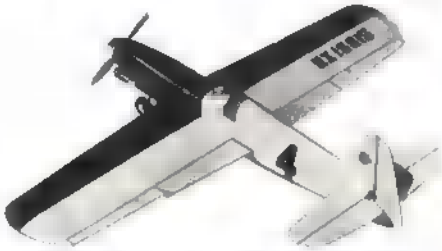
[redacted] III . . . World [redacted] twice Nats. winner. Designed by Phil Kraft. Span: 60" Eng.: [redacted] to 61 Kit RC-12 Includes T.A.C.—Ready made wing fixture $45.00



S.E.S.s Never before has a R/C scale model [redacted] designed with [redacted] attention to [redacted] most insignificant detail. Wing Span: 52" Eng.: .45 to [redacted] Kit RC-13 $47.50



THE CONTENDER—The first all-balsa R/C [redacted] you [redacted] build in just [redacted] hrs. Wing Span: 54" Eng.: .29 to .60. [redacted] RC-15 $34.95



R/C NOBLER—Radio version of the winningest stunt model of all time. Wing Span: 51" Eng.: .35 to .45. Kit RC-14 $29.95

MUSTANG P-51 . . . A standoff scale model that only a ruler [redacted] tell from a true scale plane. Wing Span: 60" Eng.: .40 to .60. Kit RC-16 $45.00

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[redacted] FUSELAGE SHELLS [redacted] FAST STURDY CONSTRUCTION

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SEM[redacted]LE STUNTERS

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[redacted] P-40 TIGER SHARK . . . Span 42" Eng.: .19-.35 Kit S-50 $8.95

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THUNDERBOLT Span-18" Kit S-22 2.95

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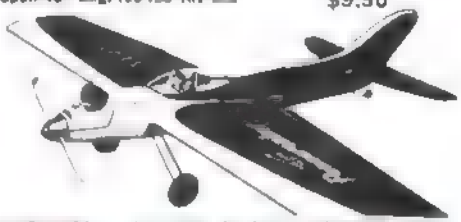
NATIONAL AYSC PLACE [redacted]

JUNIOR NOBLER . . . For expert or novice Span-40" [redacted]g.-.15-.[redacted] Kit [redacted] $9.50



PEACEMAKER . . . [redacted]perform for fast construction, exceptionally durable. Span-46" Eng.-.15-.29 Kit N-7 $10.95

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NATIONALS COMBAT [redacted]

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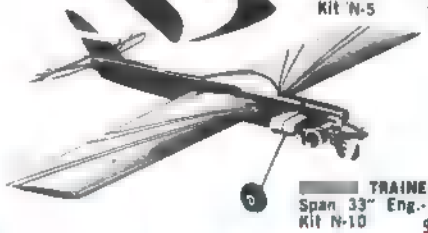
[redacted] FLITE STREAK Span 24½" Eng.-.049-[redacted] Kit N-4 3.50

COMBAT STREAK . . . Span-42" Eng.-.19-.35 Kit N-5 $7.95



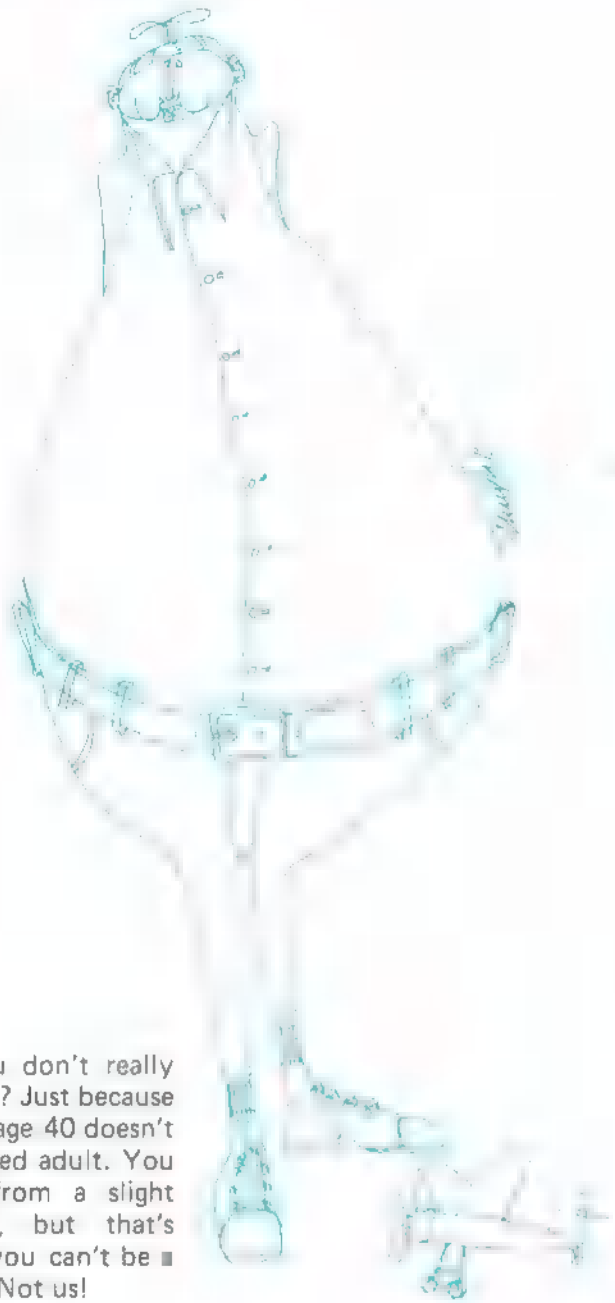
[redacted] TRAINER . . . Span 33" Eng.-.15-[redacted] Kit N-10 $8.95

CONTROL LINE COMBAT MODELS

[redacted] CATS . . . Two complete models in [redacted] box. Span-39½" Eng.-.19-.35 Kit N-8 $8.95 (2-models)

COMBAT KITTENS Span-22¼" Eng.-.049 Kit N-9 $5.50 (2-models)

TOP FLITE MODELS, INC. 2635 S. WABASH, CHICAGO 16, ILL.



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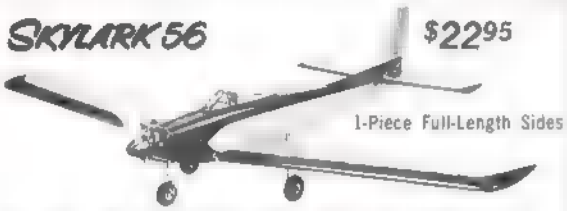

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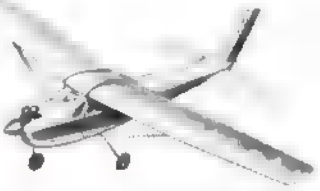

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"Enclosed is a photo of a model of your SKYLANE 62 which I have just completed. I enjoyed building this plane, it is the first model that I have built in 25 years. Several months ago I observed a group of men flying some R/C models and this rekindled my interest in model planes. Having never built an R/C model, I was dubious which model to build. After some investigation I settled on your kit and I was not disappointed. It was so different from anything that I had built previously and I must say that it went together very easily. The plans were complete, left nothing to guess work. I followed the plans exactly with the exception of the motor and I installed a slightly larger motor, a Max OS 40. I am very pleased with the results. I felt I should write and let you know how much I appreciate this kit and I hope to be able to build all of your planes eventually. Again thanks for such a fine kit."

Arnold B. Johnson
Troutville, Virginia

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Congratulations Don!

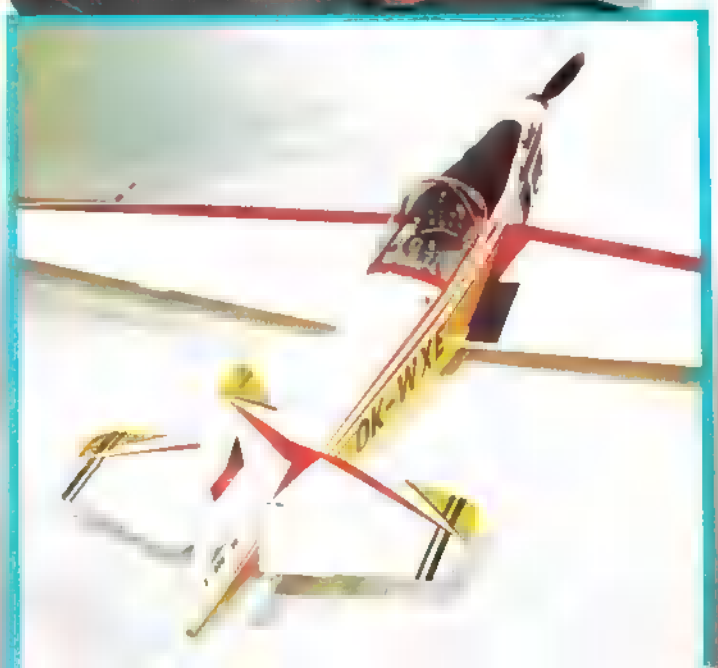
for brushing your way to 4th place in scale at the Nats

When you ask Don Botteron if you can brush Hobbypoxy, his answer is a nice collection of scale "wins," including Fourth in Scale at the 1972 Nats! Don gets those points because his Hobbypoxy-brushed Zlin beats the boys both on the ground (racking up lots of scale finish points) and in the air. Hobbypoxy brushes as smoothly as any other finish you can find, and better than most. It's no secret we designed it that way. And Don's secrets are all spelled out in the June 1972 issue of *American Aircraft Modeler*. Go back and read it!

Builder: Don Botteron; Fort Collins, Colorado. No, he didn't really use that big brush on the model, but he gets big results. It's the paint that counts, not the brush!

Plane: Zlin "Akrobat"

Finish: Brushed HOBBYPOXY



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Photos by Dick Mathis

CONTEST WINNING HLG FOR BROAD RANGE OF WEATHER CONDITIONS. CAN DO 60 SECONDS IN EVENING AIR FROM AN ATHLETIC LAUNCH

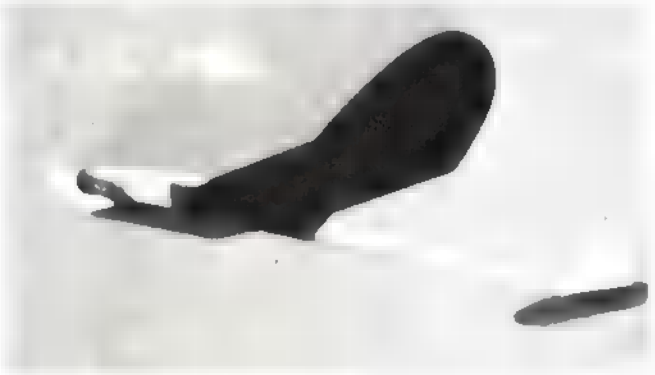
DON CHANCEY with DICK MATHIS

Contest flying with hand-launched gliders is highly personalized. Competition, effort, skill, and rivalry among the top fliers is unparalleled in other free-flight events. Perhaps the reason is that hand-launch gliders call into play all the requirements of other events—trimming, design, craftsmanship, and tactics, *plus* athletic ability. There are many people who take the event quite seriously, which is ample proof that hand-launch glider flying is highly demanding and rewarding.

The Bo Weevil is a contest glider designed for a broad range of weather conditions. Its impressive record for the last two years includes: first place in Open and second place in Senior at the 1970 Nationals in Chicago; first and third in Senior, fourth in Junior, and seventh in Open at the 1971 Nationals; first in Open at the 1971 Rebel Rally in Florida; and second in Open at the 1971 King Orange Internationals. In addition, there have been numerous high placings at local meets. Frank Perkins, Bud

Right: Fine gliders require appropriate care to preserve adjustment and condition. This carrying case holds two gliders safely on airliners or in cars for contest trips.

Below: At altitude, the Bo Weevil keeps nose up in thermals.



Tenny and I won the 1971 World Team HLG Championship with Don Chancey and his Bo Weevil. I also flew a Bo Weevil for part of my flights, until it was lost OOS, at the 1971 U.S. Free Flight Championships in California where I placed third.

With a good launch and fine trim, the Bo Weevil exceeds 60 seconds in evening air. Some still-air performance has been sacrificed for a high altitude climb and a bouncy, thermal-hanging glide. Anyone can have satisfactory results with this glider for sport or contest flying.

Construction

Select medium light balsa for wing and tail (preferably "C" stock—little visible grain, mottled appearance). If a four-in. wide piece for the wing can be found, use it. Lacking this, a one-in. wide front piece with a three-in. wide back piece spliced together on a flat surface with the back piece of the lightest balsa will suffice. Superlight wood should be avoided. A glider that is too light (in the case of the Bo Weevil, less than one oz.) is worse than one that is too heavy—can't be thrown high. About 1.25 oz. is best for most flyers.

Transfer the outline from the plans to the wing by sticking a pin through the plans to make marks on the balsa underneath which can be connected with a pencil. Mark the dihedral lines, too. Treat the marked side of the wing as the bottom so the dihedral break lines can be seen for accurate cutting after the wing airfoil is sanded. Rough carve the airfoil; sand the true airfoil with 180 grit paper and then finish with 400. Follow the same procedure for the tail surfaces.

The dihedral joints of the wing should be cut precisely, beveled for a perfect fit, then glued with epoxy. You may cover the wing with tissue or leave it clear. Don's are covered with black tissue on the bottom and mostly white on the top, which seems to give good visibility. When covering with tissue, regular butyrate dope should be used (Aero Gloss). After covering, the same procedure described below for the fuselage is followed.

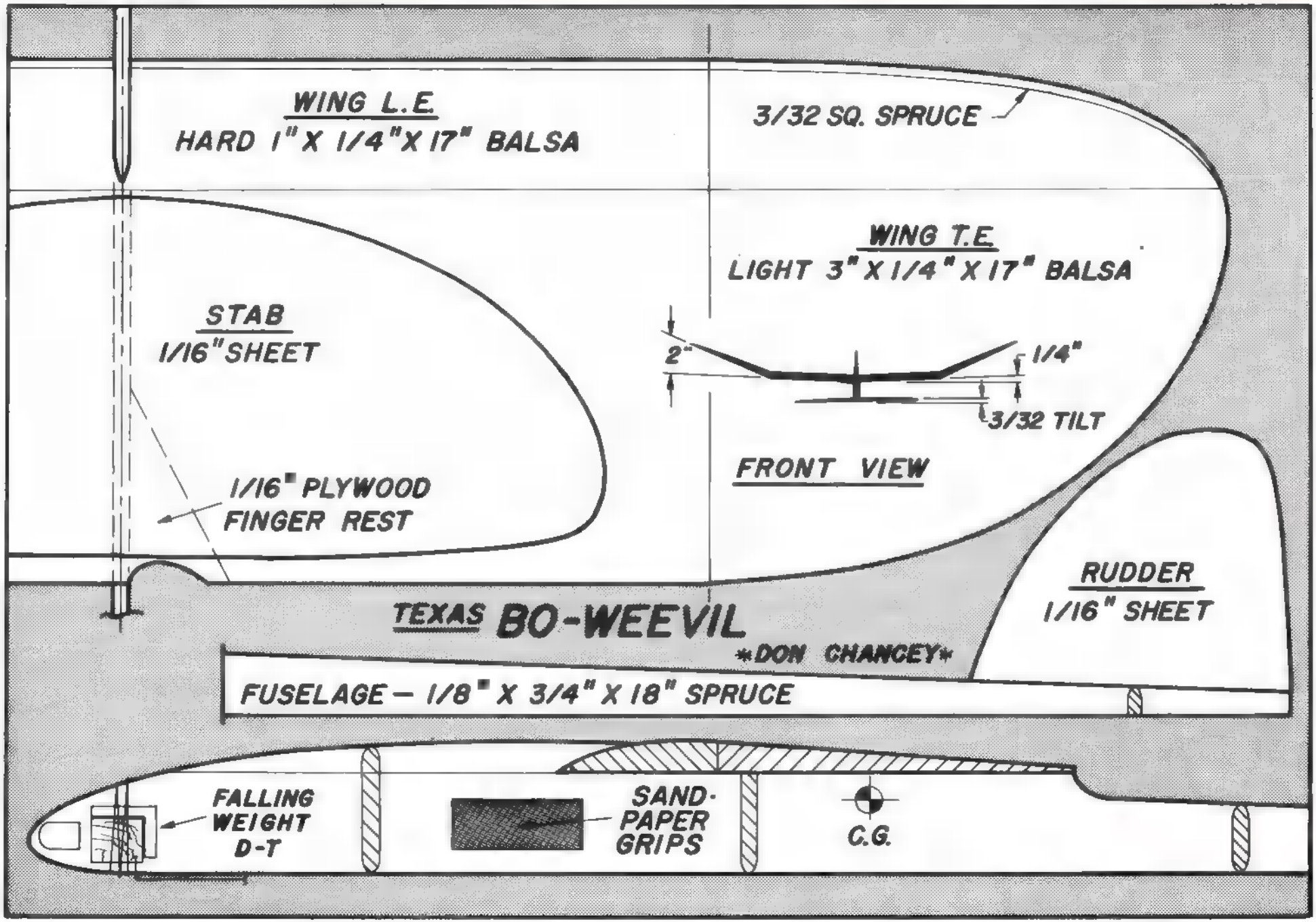
The fuselage wood is spruce. Pick the stiffest and straightest piece you can find, round off the edges and sand smooth with 400 paper. Apply several coats of lacquer sealer, sanding with 400 between coats. Apply a final coat of brushing lacquer and rub out with rubbing compound until a mirror-like finish is achieved.

Only one coat of sealer is needed for the tail, followed by a gloss coat of brushing lacquer. Take extra care to fit the finger rest and fuselage grip to your hand. They should allow a very tight grip that is still comfortable. For contest work, a dethermalizer of the type shown is essential. (M & P Enterprises manufactures one.) Add lead or clay on the nose to finish balancng at the point shown. Before flying, permanently bend the back of the left-hand main wing panel down about 1/16 in. at the dihedral joint—this will help the model resist spiral diving in thermals. Bend in slight (1/64 to 1/32 in.) left rudder tab for left glide circle.

Flying

Test glides should show a flat, slight turn. Toss the model purposely into a stall to check the recovery. Correct poor recovery with up elevator, or continued stalling with down elevator (moisten trailing edge and breath on it while bending). Hard launches should reveal a quarter-turn climb to the right with no snap rolls, spirals, loops, etc. It should just go almost straight up and bank hard to the right as it slows into the glide going downwind.

To obtain a good pattern you may also use stab tilt (to tighten glide without affecting the climb—turns toward high side) or differential deflection of the right or left elevator to create a rolling effect in the climb. Contest flying requires practice so you will not have to think about how to throw or whether the glider is trimmed. You must be free to concentrate on finding thermals. If it is necessary to run downwind to put the glider under another competitor's which is in a thermal, do so. Watch other models, thermal detectors, flying insects, and anything else that insures launching in a thermal.


WING L.E.
HARD 1" X 1/4" X 17" BALSA
3/32 SQ. SPRUCE
WING T.E.
LIGHT 3" X 1/4" X 17" BALSA
STAB
1/16" SHEET
2"
1/4"
3/32 TILT
FRONT VIEW
1/16" PLYWOOD
FINGER REST
RUDDER
1/16" SHEET
TEXAS BO-WEEVIL
DON CHANCEY
FUSELAGE — 1/8" X 3/4" X 18" SPRUCE
FALLING
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GRASPING The INFINITE

ANNUAL DCRC RECORD TRIALS HAVE NETTED THE USA MANY WORLD RECORDS. IN SPEED THE NEW GOAL IS TO EXCEED 214 MPH. CAN IT BE DONE?

CHARLES and MIKE FITZPATRICK

On Labor Day weekend, 1971, a small but dedicated group of RC modelers ventured into beautiful Virginia with one idea in mind: to pulverize the European-held FAI records. However, they failed to achieve this goal. We will nonetheless relate some of the exciting details and events of those three memorable days and let the reader decide whether or not this failure can long endure.

It's true, we Fitzpatricks have made our name in CL Speed—not RC; in fact, until 1971 we didn't even know what ■ servo was. Speed and speed engines have always been our passion. Well did we know of the DCRC Annual Record Trials scheduled for September 4, 5 and 6. We decided to travel from New York to attend—to watch those lovely wireless speed birds track through the open blue skies. The meet was held at the most fabulous RC flying site we have ever seen—the U.S. Naval Weapons Laboratory in Dahlgren. Endless blacktop runway stretched seemingly into infinity, flanked everywhere by the green grass of colorful Virginia.

Cliff Telford and Bob Violett brought two bright orange RC speed models and invited us to inspect their efforts. One plane was powered by an ST 60 ABC; the other had no engine. Both jobs were identical in design except that the one without an engine was obviously made for a rear exhaust tuned pipe engine.

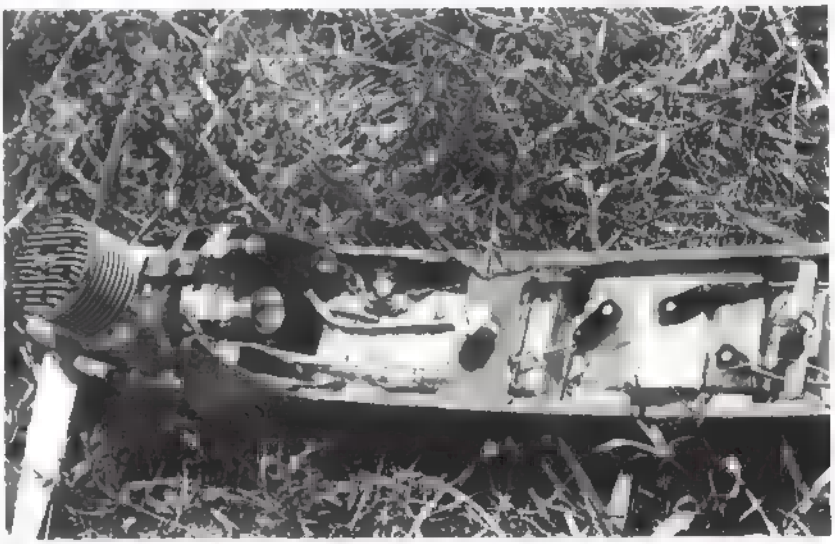
Having designed a successful .29 displacement speed engine ourselves, we were interested in seeing their TWA. We had long ago seen the TWA 15 out in the CL Speed contest circuit, but we were quite curious as to how the new TWA 61 engine looked.

Cliff, the engine man of the team, had an RC carb of his own design made for this massive and impressive engine, which, together with the tuned pipe, will set you back $200 and is available to anyone with that kind of money to spend. Using this Roger Theobold and Bill Wisniewski-designed engine without the full tuned pipe will get you nothing but a lot of noise. Insert the pipe and it turns into ■ lion. At least ■ 35 to 40 power rise can be recorded when the engine "comes in." (Bill left K&B, where he was machine shop foreman and designer of all the Dykes Ring Torps, to produce these custom-made precision speed instruments. Knowing quite well that Cliff and Bob had never used ■ full tuned pipe system, we advised them to concentrate on the ST ABC.

The TWA 61, because of the one in. bore, short stroke, and lack of ■ flat mid-section on the pipe, is ■ very critical system.

Note expression on holder's face as the engine comes to life. Maynard looks satisfied, George Pickeral reaches the glow plug clip to disconnect.

The TV plane is like an enlarged CL Speed ship. Note access hatch behind wing to get at the servos and internal equipment.



A lot of gear, plumbing, tankage and electronics are crammed into a Speed plane—here's Hill's model.

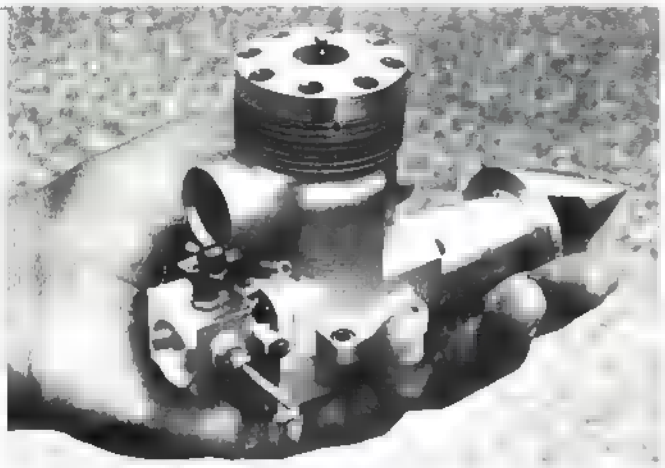
While Bob keeps the plane on course in sight at over 170 mph, Cliff reaches to set the remotely adjustable needle valve.

Something quit—another Speed job is wiped out. Several were lost at Record Trials.

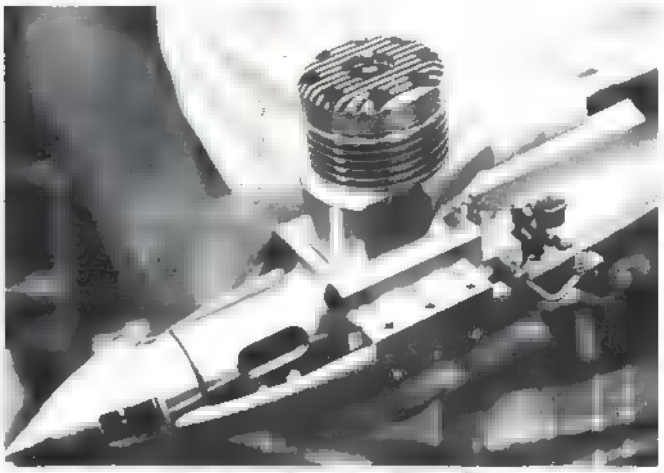
John Spalding heaves Maynard Hill's machine into the blue. These planes are actually powerful and light, they leap from the launcher's hand into the air.

Cliff Telford has tossed the Violett Speed plane into flight. It is a graceful looking ship. Workmanship is outstanding, design is entirely original.

Photos by Charles and Mike Fitzpatrick

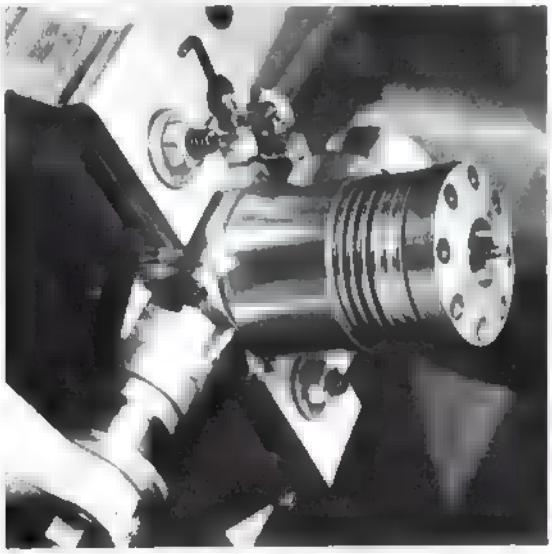


Here's a Clary/Wisniewski 61 with tuned pipe removed. Has the well-proven Schnuerle porting, rear exhaust and rear intake.

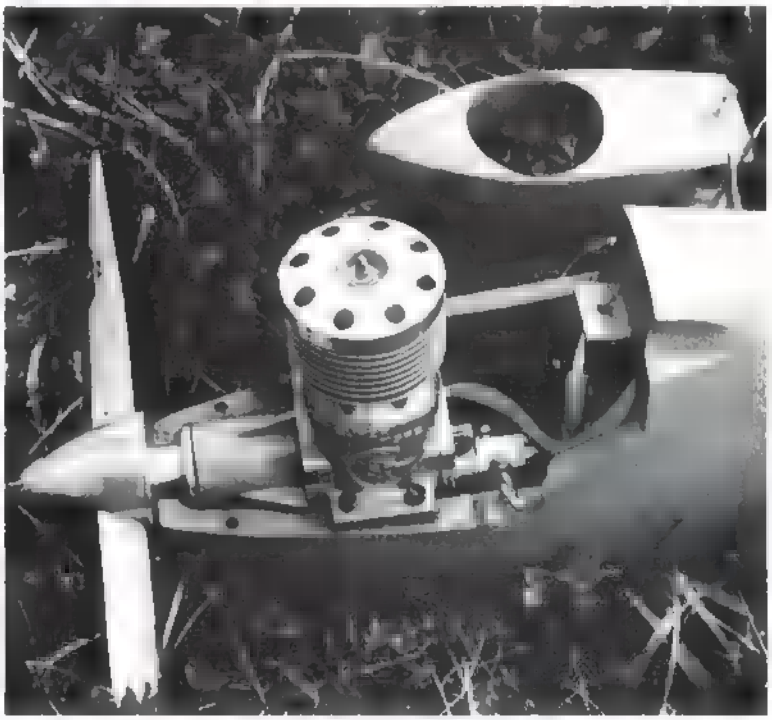


An experimental front disc induction 60 by Bob Hemingway and Chuck Wiechard in 1968 could power a current RC design at record speed. Uses S.T. ABC liner and piston.

The Roselle and Frye engine is a very likely speed record setter. Has chrome-plated bronze liner and a piston of 20-24 aluminum. This one is only a prototype and uses some Rossi parts.



A carefully reworked S.T. 60 was in one of the two TV team planes.

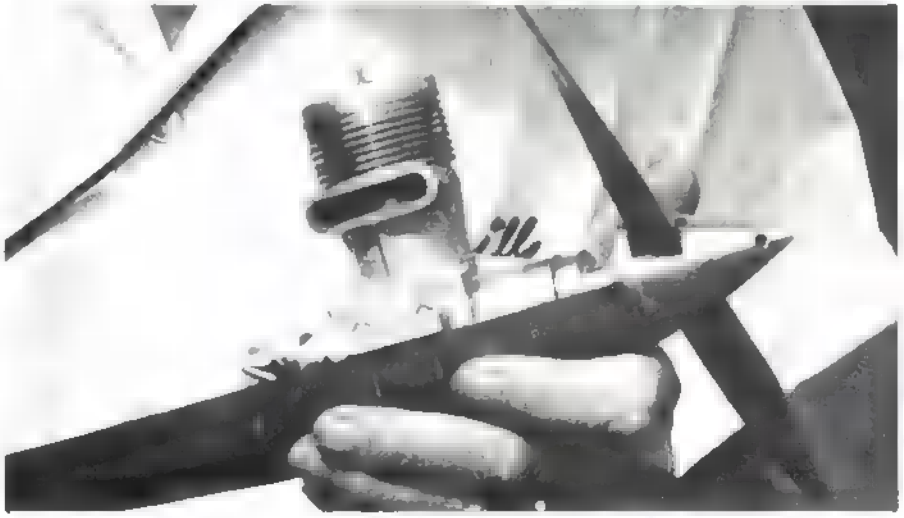


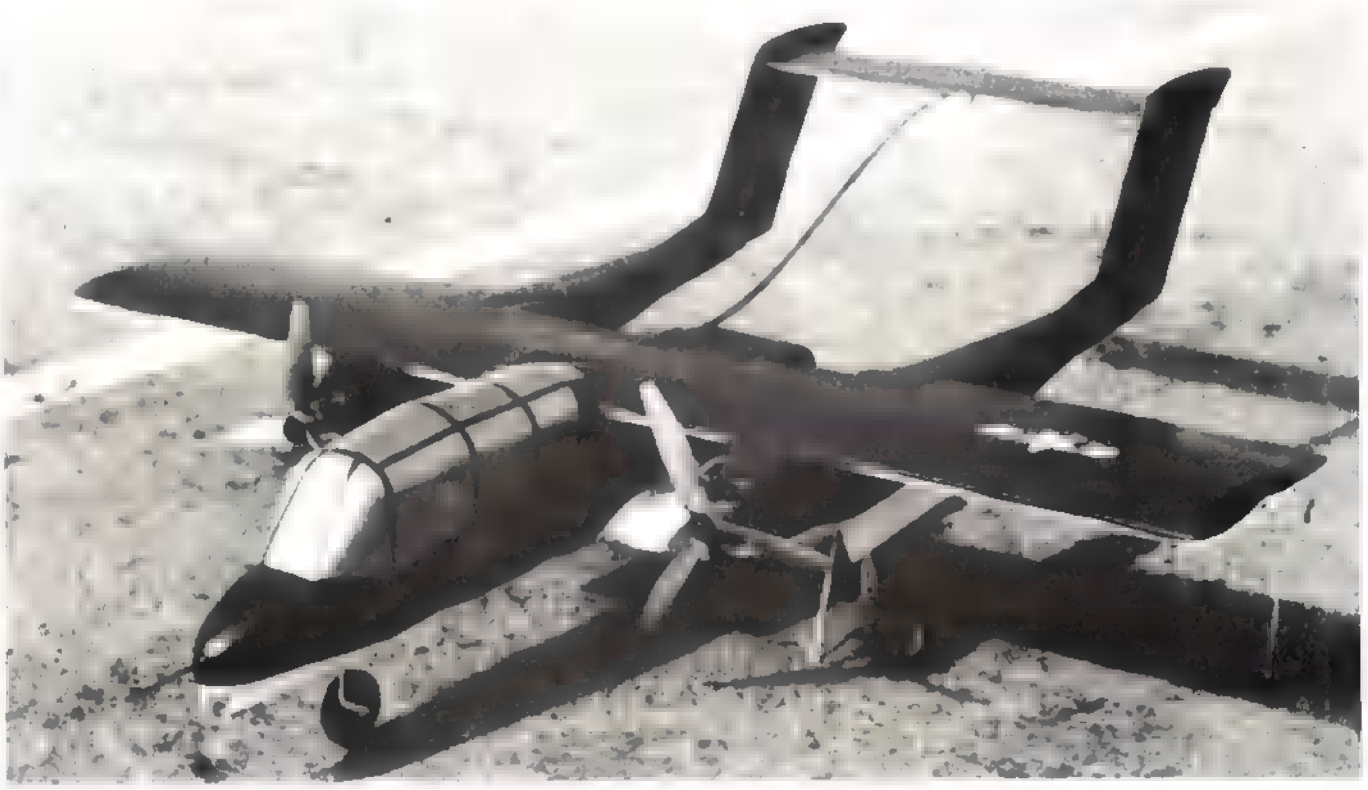
A year ago we met Maynard Hill in White Plains, New York. At that time we discussed engine design—the OPS in particular. We thought he would have a difficult time breaking the RC speed record with this engine. He strongly differed with us. We wondered whether he was using the OPS for these record attempts. He wasn't. (We saw a number of them collecting dirt at Dahlgren.) Both Maynard's RC speed planes had ST 60 ABCs up front.

Maynard was at Dahlgren with his hard-working team of about six whom we saw launching one of his two RC speed machines into still air. It looked a lot easier than we're sure it really was. They had already taken numerous flights that morning, and this was just one more run. Intense concentration marked the face of Maynard as he calmly put the plane into a 45° climb and proceeded to make it no more than a large speck to his left. A dramatic turn was followed by a dive you had to see to believe. We were sure he wasn't going to pull out of a dive like that. He had the engine, an ST 60 ABC, at full bore;

(Continued on page 80)

The Rossi is a fairly competitive engine with adequate reworking. Rear exhaust version is more efficient, however, since tuned pipe mounting is streamlined and porting is better.





Bronco

AIRBORNE EQUIVALENT OF THE JEEP MAKES FINE CARRIER OR SCALE MODEL WITH TWIN 19'S OR 29'S. LANDS ON DECK EASILY WITHOUT A HOOK.

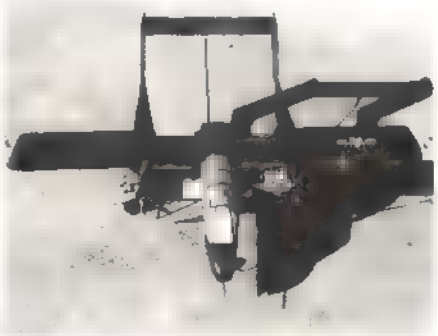
JIM LABARGE

The OV-10A Bronco was designed by North American Rockwell to replace the aging, unarmed Cessna Bird Dogs used by the Forward Air Controllers in Southeast Asia. Former President Johnson called this aircraft "the airborne equivalent of the jeep." The powerful Bronco has certainly lived up to its nickname.

In 1966 *Air Progress* ran a cover story on the OV-10A and included some drawings. I normally look for unusual airplanes; here was one. Not being sure what kind of model it would make, I built up an all-sheet 049 version. Surprisingly, it flew well. A number of these 049 Broncos were tried out with built-up wings, booms and the like. Satisfied I had a good model, I proposed the little bird as an article for AAM, however, it was suggested that I try a bigger built-up version for Carrier and/or Scale. After much head scratching and midnight oil burning, the prototype appeared at the flying field. While the design was being worked out, Frank Ehling, the technical director for AMA, gave permission to fly the Bronco in Carrier with or without the tailhook. Now we had a model to stop the show in Carrier. And stop the show it does.

Just because the OV-10A has two engines, don't panic and run away. Though there haven't been any twin engines in Carrier since the early '60s, that doesn't mean twins won't work. Properly set up a twin can be a real asset. How many times have you seen a single-engine Carrier model shut down and crash like a rock? That second engine will prevent an embarrassing dunking. If you read the fine print in Section 20.10 in the AMA rule book under Navy Carrier, you will find an extra five points just waiting to be given to the owner of a Bronco. Some Carrier models veer over and lose points or damage airframes. Being a tricycle-geared airplane, the OV has never nosed over, and I save on props. The extra engine is not a problem if you know your engines. I have normally been airborne in 30 seconds.

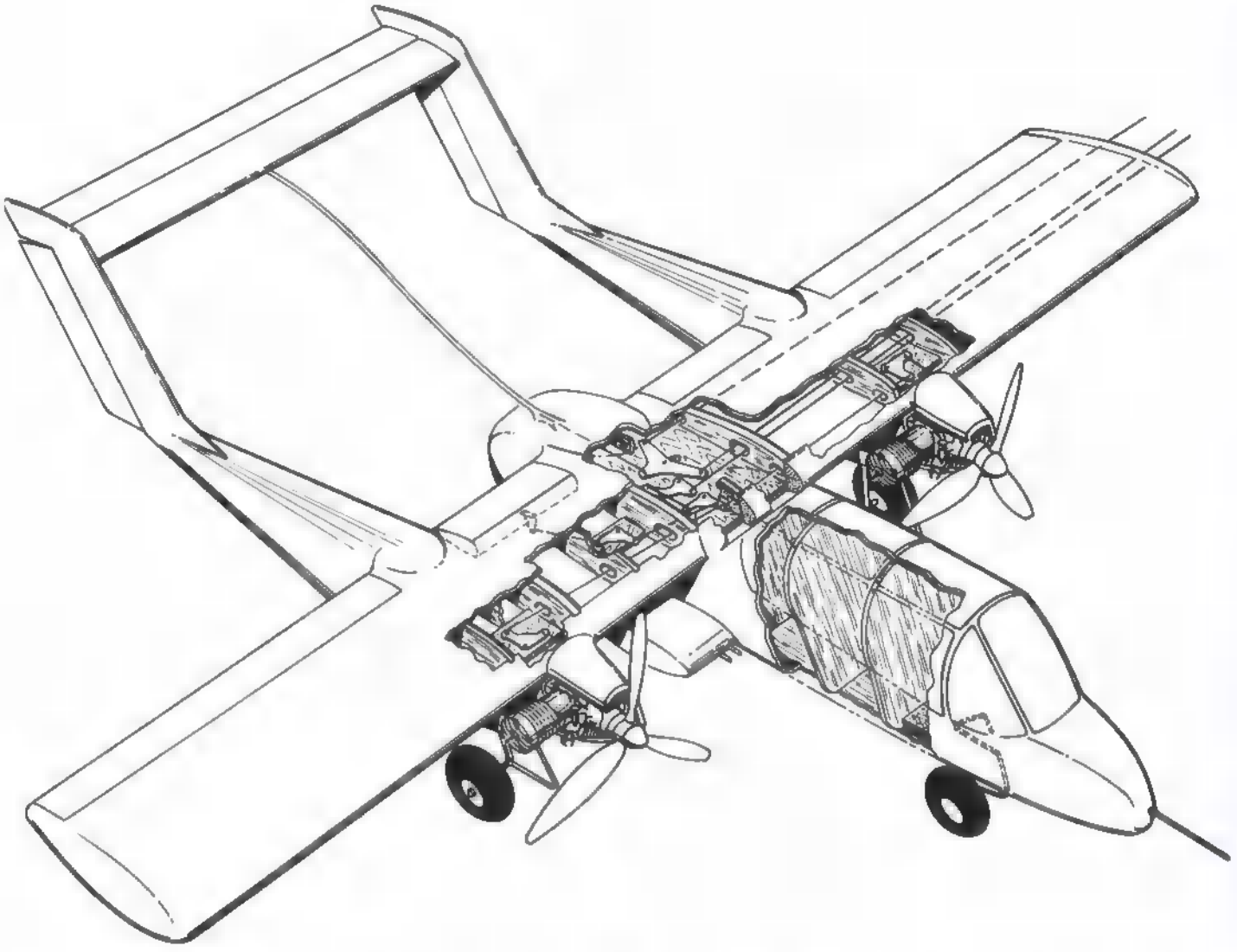
Tricycle gear is great help in Carrier landings. With wheel brakes, full stop landings on the deck can be made.



The aircraft depicted in this model is the Navy-Marine version. It can fly Class I or II just by changing the 19s for 29s (scale is 1" : 1'). Although the canopy is sheeted, the model is close enough to scale to win the the Scale event. The OV won third at the 1971 Air-Zona Invitational.

Before you start building, decide whether you want to fly Carrier or Scale. If you have no intentions of flying Scale with the "Bronco," there are a number of things that can improve performance. First get the hottest engines available and install slide valve exhaust and fuel throttling pressure. Replace the clunk type tank with homemade brass tanks and replace the scale wheels with thin speed wheels. Extra details such as machine guns, wings walks, pitot tubes, rivet details and the scale finish can be sacrificed to cut weight. You may want to cut out the centers of the formers but I feel you will cut the life of the model. I am sure there are more ideas, but these are a start.

If you want full scale points for Carrier landings, do the following while



the model is being built. Install ■ set of Rocket City wheel brakes to the main gear wheels, and actuate the brakes by running a nylon line up to the throttle transfer crank. Since the brakes *must* stay clean to work, mount the tank overflow tube away from the brakes. A set of Tatone-type manifolds will keep gunk off the wheels.

If you only want to fly Scale with the OV-10A, here are some modifications. Add spinners to the engines, route engine exhaust to scale exhaust ports, make up shock- absorbing landing gears, and make the flaps retractable. By mounting the Nyrod in one of the booms and replacing the sheeted canopy with ■ .030" plexiglass canopy, the scale effect increases. Add a detailed interior and dropable stores, and the Bronco will take on any scale airplane. More information on the OV-10A Bronco can be obtained from North American Rockwell in Columbus, Ohio, and Garrett AiResearch in Phoenix, Arizona. I have found both companies most helpful.

Construction

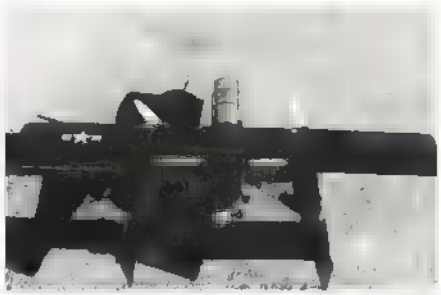
The model should be built in five sections and then assembled into one. Since weight can hurt performance (especially in Class I), keep everything ■ light as possible. The model is big compared to most carriers. Follow the plans carefully. Some new ideas are incorporated in the design.

Cut out all eight pieces of the tail section from ¼ ■ 6" Sig contest balsa. Glue dorsal fin to main fin and fin to stabilizer. Leave rudders off until final assembly. Hinge the elevator with polypropylene hinges—three will do. Mount a fairly long control horn on the elevator to minimize movement. Check alignment carefully, and set aside to dry.

Next cut out the formers for the booms and the 1/8" balsa boom sides, tops, and bottoms. Then bend the main landing gear to shape. The 1/8" m.w. is tough to bend; use ■ torch, a vise, and ■ lot of oomph. ■ careful. Use the correct size Sig aluminum mounts and drill for your engines (Series 71 Veco 19s were used on the original). Then drill the firewall and bolt the engine mounts to it with blind nuts. If you are going to interchange engines, make both sets of mounts and set up the firewall so they are interchangeable. Bolt main gear to its former with J-bolts and epoxy the whole assembly. These take the landing load so do a good job. Make sure you mount the gear properly: one left, ■ right. Glue formers and sides together, and let dry. Use a long drill to make the holes for the fuel tubing; modify the two oz. Veco clunk tanks as shown on the plans. Mount these on the centerline of your engine. Add 1/8" top and bottom sheeting. The rest of the sheeting is added later.

To build the main fuselage, cut out the formers, make up and bolt the nose-wheel to its mount, and glue the 1/8" balsa sides, formers, and nose-wheel mount together with epoxy. If this is a Carrier Bronco, sheet the cockpit from F-8 to F-10 with 1/8" balsa strips. Section F-10 to wing is left until final assembly. Sheet bottom corners with 1/8" balsa. Add hollowed out windshield, nose and tail blocks. Sand and set aside for final assembly.

The wing is where new ideas are used. Because of the large wingspan and chord, I thought something stronger than balsa sheeting was needed. I tried 1/64" ply sheeting from Sig. No seams are needed since the sheets ■ large enough. First cut out the ribs and glue the LE, TE, and ribs together. Watch for warps. Mount the Roberts bellcrank and the 90° transfer bellcrank to the mount. Attach leadouts, and glue mount in place. Glue transfer bellcrank mounts into framework. Mount bellcranks as shown. Make up transfer rods from



Author's dual-purpose Bronco, finished and detailed for Scale and rugged enough for Carrier. Those little flaps really slow it up.

1/16" Oxy-Acetylene welding rod. Check system for smooth operation. Wires from transfer bellcranks to throttles are added during final assembly. Glue flap crank mount in place; mount bellcrank. Make up flap wire and install. Glue on bottom ply sheeting. Cut out openings for throttle wires in bottom sheeting. Make up and hinge flaps at trailing edge. Add brass tubing and dropwire to right flap. Set wing aside to cure. Top sheeting and other wing parts are added later.

Now for the fun part! Collect a number of dope cans, rubber bands, pins and a lot of glue. Epoxy main fuselage in place on wing, using a triangle to check alignment. Epoxy booms in place on wing and make sure it is aligned. Any misalignment can mean disaster with twin engines. Balance whole assembly on the dope cans and allow to dry.

Temporarily mount engines and make up wires between transfer cranks and the throttles, then remove engines. Add corner sheeting to tops of booms—1/8" wide strips work well. Add strip sheeting from F-3 to F-1 on bottom of booms and from F-3 back on the bottom of the booms. Sand and fill any cracks or nicks.

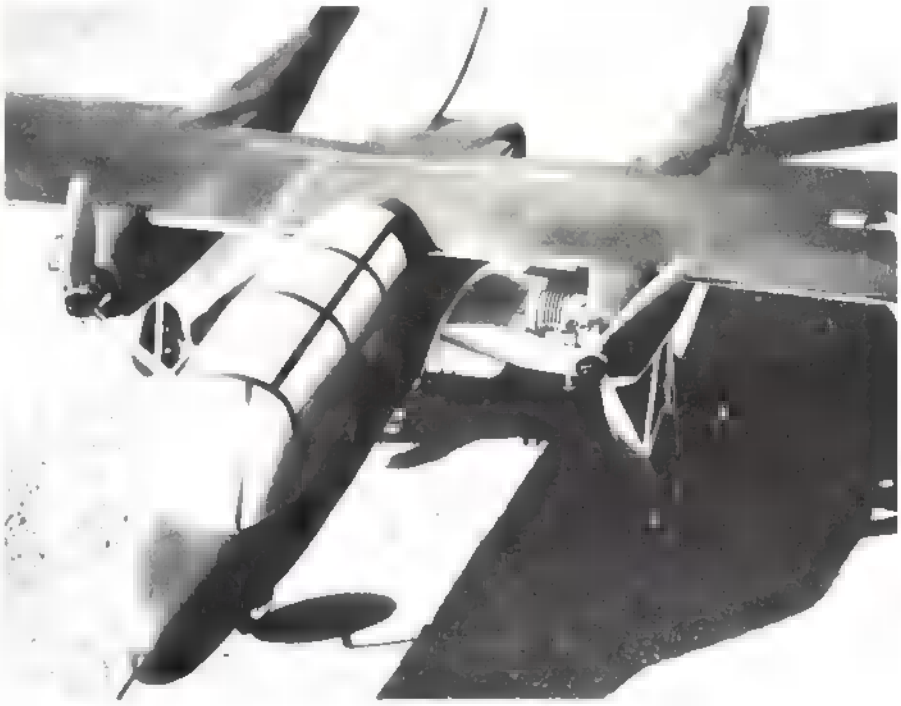
Epoxy tail assembly to top of booms and make sure it is on true. Glue rudders in place with ¼ to ½" offset.

Attach one end of the Nyrod to the Roberts bellcrank, and epoxy one end of the outer tubing to the trailing edge. Notch the TE so the tubing sets flush. Cut Nyrod to length, and attach to elevator horn. Epoxy outer tubing to stabilizer spacing it as necessary for smooth operation. Epoxy two or three oz. of lead in the outboard wing tip; don't forget it. Glue inboard tip on, and put brass tubing bearings for leadouts in place.

Add strip sheeting from F-1 to wing on top and from F-10 to wing on top. Fillet all joints with Hobbypoxy Stuff and sand. Add the four landing gear doors to the booms and the two doors on the main fuselage. Sand the whole model before starting the finishing.

There has been some talk that the Bronco is not usable for Carrier. In addition to the fact that AMA allows landing without a hook, some new information makes the OV even more usable. The Bronco normally uses the reversible turbo-props to achieve slowdown. I have found from USN sources that the OV is fitted with small

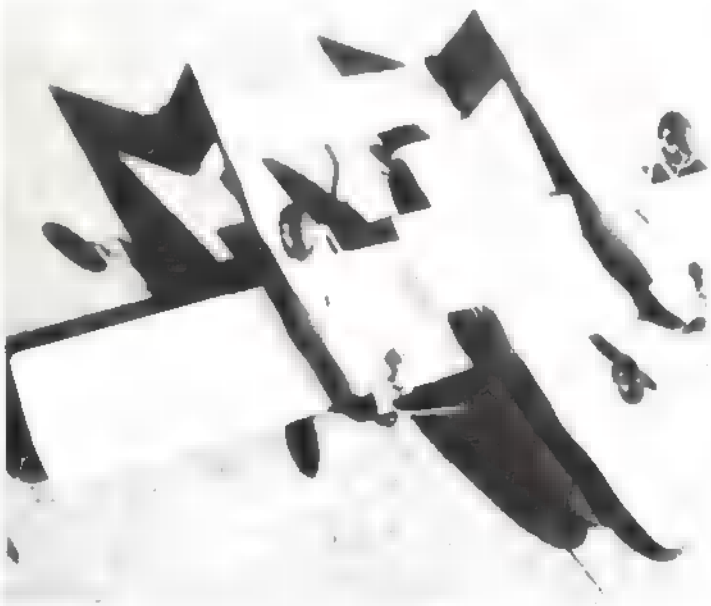
(Continued on page 78)

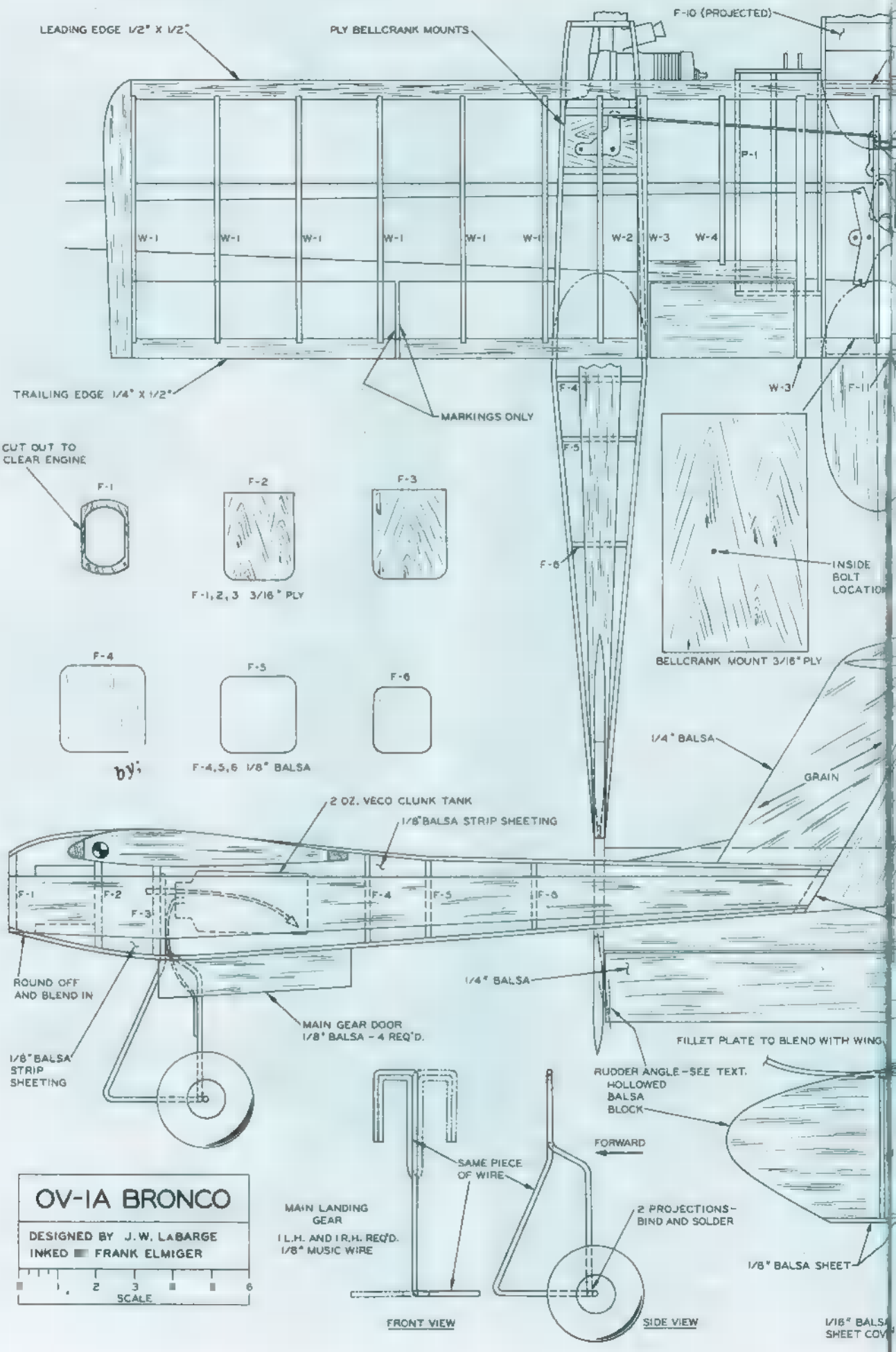


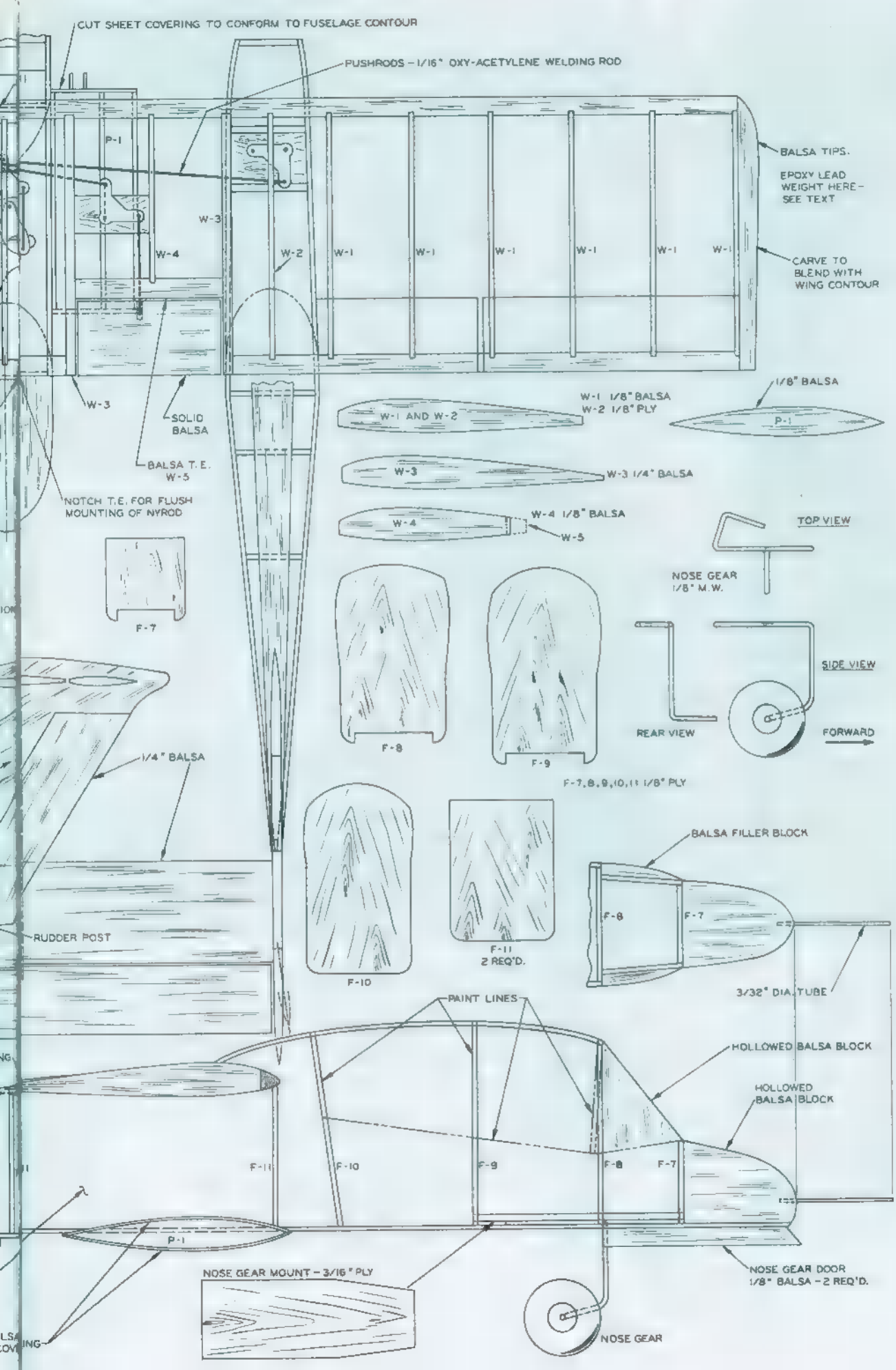
Above: Start left engine first. It's a bit inaccessible since cylinder is just under the wing leading edge.

Right: Firewall has blind nuts located to hold engine mounts for both 19- and 29-size engines.

Below: On the real plane, rockets, machine gun or bombs are carried on the stub wings.




LEADING EDGE 1/2" X 1/2"
PLY BELLCRANK MOUNTS
F-10 (PROJECTED)
P-1
W-1
W-2
W-3
W-4
TRAILING EDGE 1/4" X 1/2"
MARKINGS ONLY
F-4
F-5
F-6
F-11
CUT OUT TO CLEAR ENGINE
F-1
F-2
F-3
F-1, 2, 3 3/16" PLY
INSIDE BOLT LOCATIO
BELLCRANK MOUNT 3/16" PLY
F-4
F-5
F-6
F-4,5,6 1/8" BALSA
1/4" BALSA
GRAIN
2 OZ. VECO CLUNK TANK
1/8" BALSA STRIP SHEETING
ROUND OFF AND BLEND IN
1/8" BALSA STRIP SHEETING
MAIN GEAR DOOR 1/8" BALSA - 4 REQ'D.
FILLET PLATE TO BLEND WITH WING
RUDDER ANGLE - SEE TEXT.
HOLLOWED BALSA BLOCK
FORWARD
SAME PIECE OF WIRE
MAIN LANDING GEAR
1 L.H. AND 1 R.H. REQ'D.
1/8" MUSIC WIRE
2 PROJECTIONS - BIND AND SOLDER
1/8" BALSA SHEET
FRONT VIEW
SIDE VIEW
1/16" BALSA SHEET COV
OV-1A BRONCO
DESIGNED BY J.W. LABARGE
INKED FRANK ELMIGER
SCALE



FULL-SIZE PLANS AVAILABLE—SEE PAGE 84

Fly the Dawn Patrol

You're a daring British ace of World War I when you take off in your Sopwith Camel just as the sun rises over France. And you're hoping you'll tangle with one of Von Richthofen's Flying Circus—maybe the dreaded Red Baron himself—flying a fast, maneuverable Fokker DVII.

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PART 2 OF 2

Supreme

FOLLOWING LAST MONTH'S TECHNICAL ANALYSIS OF UNLIMITED RUBBER MODEL PERFORMANCE, HERE'S THE FANTASTIC 15-MINUTE FLYER. PLANE CAN BE BUILT DIRECTLY FROM PLANS ON THE NEXT PAGES.

JOHN GARD

No one significant design feature built into this airplane pinpoints its outstanding performance. However, the model does incorporate many design features which improve performance, and they have made a significant contribution toward the goal of attaining the "ultimate performance."

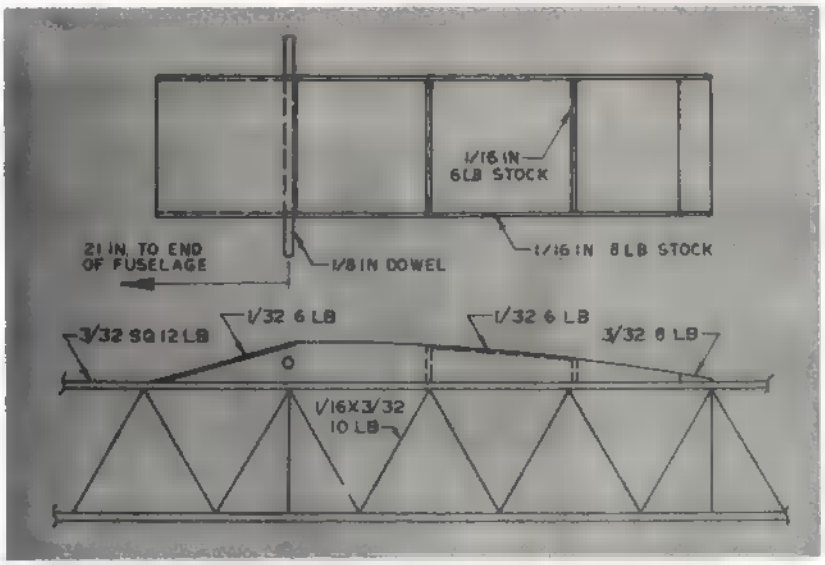
Construction

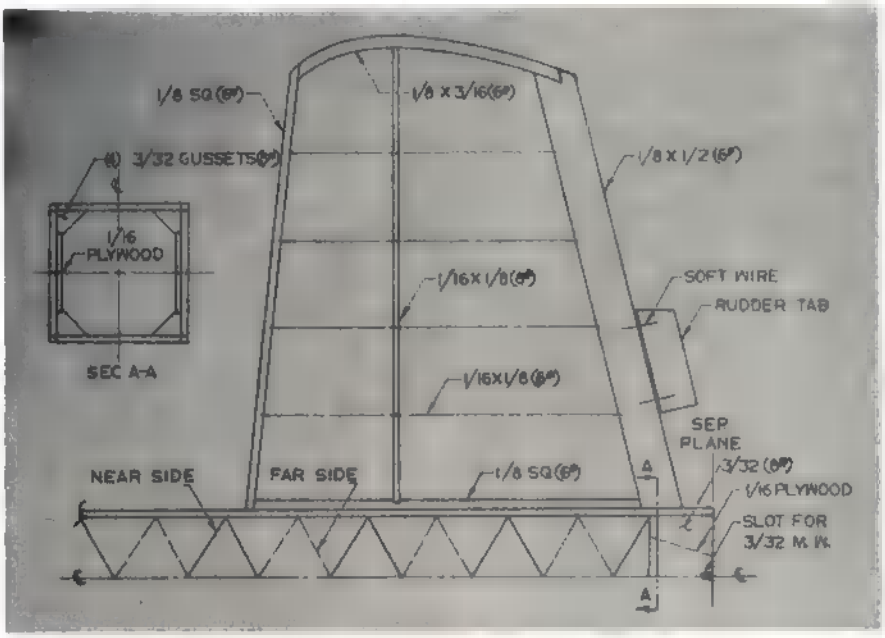
The airplane is not difficult to build. The only power tool necessary is a portable drill. A 4-40 tap and die may be the only items you need to purchase.

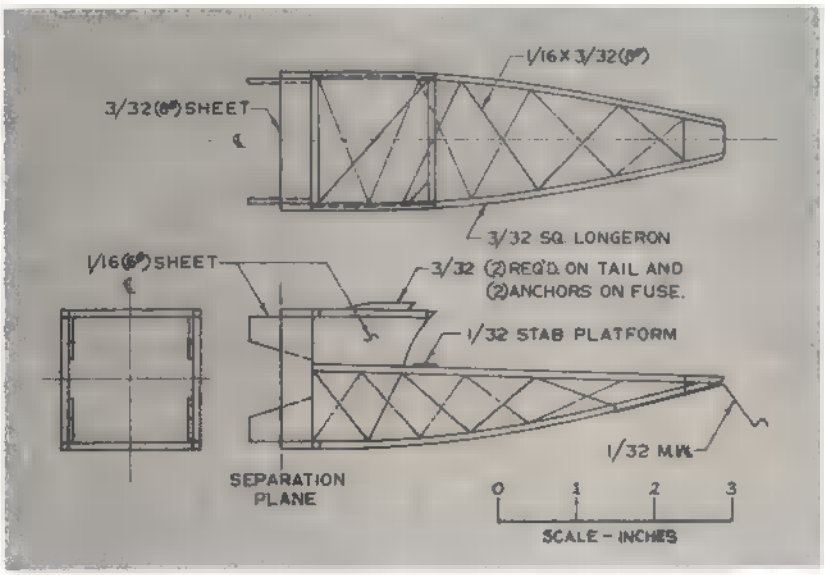
The first step in building the wing is to select balsa with the correct density for each component. I do this by weighing each 3 ■ 36" sheet before stripping to the correct size. (Note the correct wood density specified.)

Make ■ template to cut out all ribs from 1/32" sheet. Next cut out the center span spar from 1/32" sheet. Notch the spar to one half its depth on the top side, and notch the ribs ▬ half their depth from the bottom side.

Assemble the wing on a soft white pine board. Pin a 3/16" square piece of scrap balsa equal in length to the span of the center section to the board. Pin the spar on top and at the rear edge of this piece. Locate ■ 1/16 x 1/8" piece of scrap balsa so it supports the aft end of each rib. These two blocking strips will give proper airfoil contour during assembly. Cement all ribs to the spar. Shape the TE from 3/32" sheet, notch and cement ▬ place. Cut the LE from 1/8" sheet, notch and cement into position. Allow to dry and remove center section from the jig. Enclose the top and bottom sides of the torque box with 1/32" sheet. Sand the section to obtain the proper airfoil shape.







Assemble both intermediate and tip panels following the above construction procedure. Build the right tip panel with a wash-in of 3/16". Make sure end ribs at each dihedral joint are 3/16" from their ends.

Bevel the ends of each panel slightly on your bench saw to obtain the correct dihedral angle. Make these butt joints, and cement the tip panel to its adjoining panel. Cement both panels to the center panel section. Reinforce all dihedral joints with a light mesh of fiberglass. Shape wing tips from four to six lb. density 3/16" sheet after cementing to each tip rib.

Make a rib template for the stabilizer and cut out all ribs. Assemble and sand in the conventional manner. Shape tips from four to six lb. density 1/8" wood after cementing each to its tip rib. Add 1/32" sheet to center LE bay.

The fuselage motor tube is 56" long. My fuselage is 1-5/8" square, but I suggest a cross section 1¾" square. First build up the two fuselage sides making sure the diagonals cross when one side is laid on top of the other.

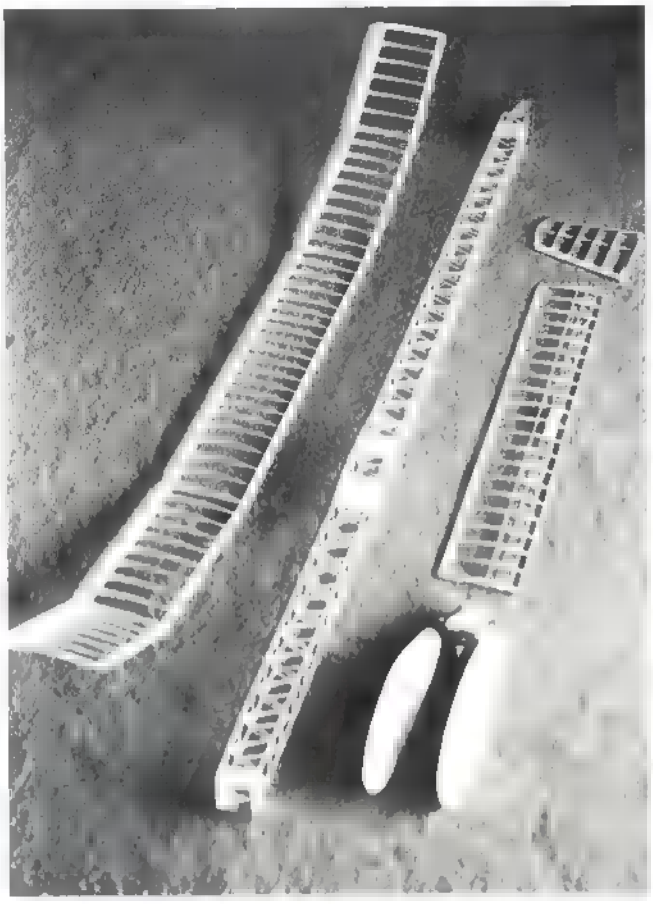
Pin to the pine building board two straight strips of wood equal in length to the fuselage and spaced 1¾" apart. Set the two fuselage sides upright between these edges and pin in place. Continue construction by cementing all diagonals, cross members and sheeting in place. Turn the assembly over and complete the top side. Cut the fuselage into two pieces with a razor blade at the separation plane. Add two 1/16" plywood reinforcement pieces and four corner gussets to the forward section. Then attach four 1/16" balsa keys to the tail section. Sand all four sides of the fuselage and reinforce the sheeted nose section with silk.

Make the rear motor fitting from 3/16" mag plate. Cut and shape with hack saw, then file and smooth with emery cloth. Drill a No. 43 hole in the forward end of this fitting, center the one-in. length of 3/32" m.w., and epoxy in place. Drill two 3/32" dia. holes in the rear of the fitting—one to be used for winding and the other to receive a two-in. length of 3/32" m.w. for the rear motor anchor.

Fin and wing mount offer no problems and are built as indicated by the drawing. The fin is cemented to the fuselage after all parts have been covered with Jap tissue, water shrunk, and three thinned coats of nitrate dope (50%-50%) applied.

Make the prop shaft from 1/8" m.w. Cut to length and heat both ends to a cherry red with an L.P. torch and air cool. Chuck in a portable electric drill and file each end down to .11" dia. Cut 4-40 threads on each end. Shape the prop hub from a piece of 3/16" mag plate. Drill the hole for the prop shaft in the hub with a No. 43 drill and tap with 4-40 threads. Open up this hole to 1/8" dia. and a depth of 1/16" on the back side of the hub. Thread the prop shaft to the hub and lock tight with a 4-40 nut. Key the hub and shaft with a .05" dia. wire driven through a 3/64" hole.

(Continued on page 69)

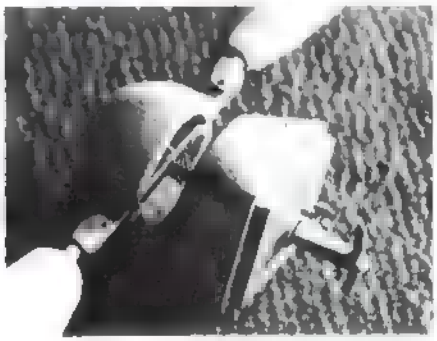


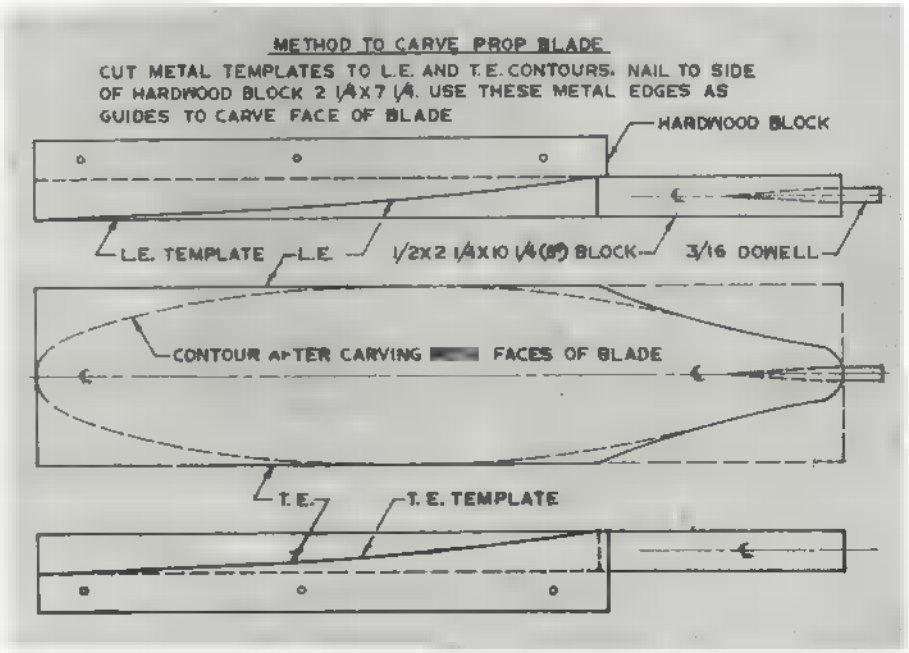
Left: Skeleton reveals strong warp resistant structure. Diagonal ribbed fuselage firmly resists motor torque.

Below: Motor is wound from the tail. Rubber bands hold stabilizer unit in place on tight-fitting plywood tongues.

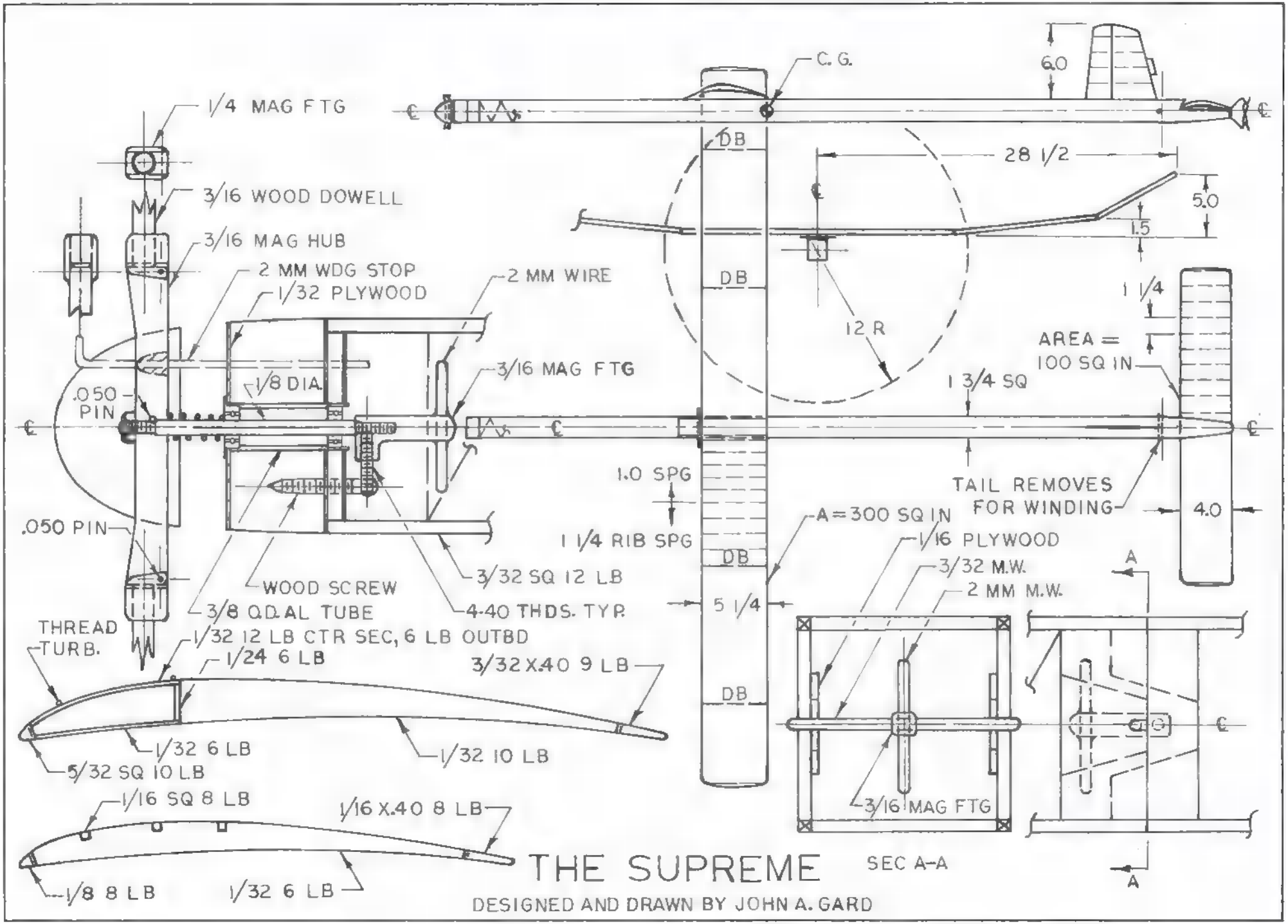
Left: Interior view of rear rubber motor attachment. The "T" mount offers minimum rubber fatigue and easy grip for the winder without handling the rubber itself.

Right: The hub assembly uses carefully shaped magnesium and aluminum parts. Spinner helps glide slightly.





MORE PLANS ON PAGE 36



THE SUPREME

DESIGNED AND DRAWN BY JOHN A. GARD

ON THE SCENE

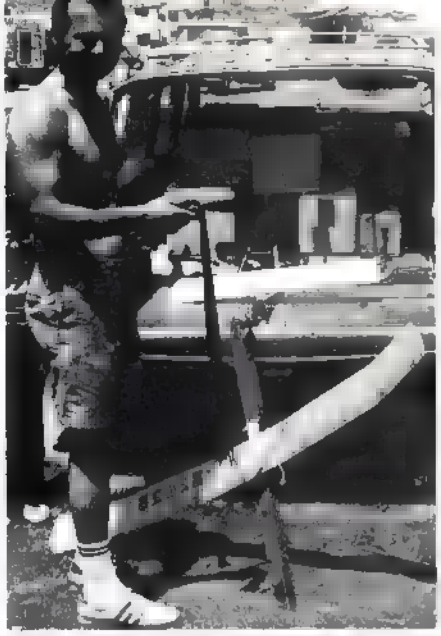
The Taft Bash

DICK MATHIS

The second USFFC is now modeling history. It was bigger and better than last year and promises to be more so in 1973. Symbolically, the USFFC represents FF at its zenith. FFers around the country should start planning now for the 1973 meet—they won't be disappointed. In years to come we will sit around and reminisce about the experiences of the first two years at Taft the same way fliers now reminisce about the first AMA Nationals in the '40s. In an age gone soft and flabby, this contest is lean and hungry.

Contestants from as far as Canada, New Jersey, Michigan, Illinois, Indiana, Oklahoma, Texas and Mexico chose to spend their Memorial Day weekend at Taft to give the contest's name validity. The bulk of contestants are contest-wise Californians which makes the competition extremely tough. A trophy from the USFFCs deserves a place right beside one from the AMA Nationals. It is impossible to accurately convey the full details of the three days of competition. For example, there were many interesting aspects of the contest besides the winners. Maybe some of these impressions will help capture the essence of the affair.

The Field: The desert, with very sparse, tired looking 18 to 30 in. bushes, sandy washes and mountains looming all around, is not level, but it goes for miles with no fences, houses, or man-made structures anywhere. Tom Peadon, the week before leaving Texas for Taft, first had a dream that the site would be miles of mown Bermuda grass, and then a nightmare that it would be one giant sand dune. It's somewhere between the two.



After a string of five easy maxes on a new Unlimited Rubber job, Bud Romak lost the plane and when being returned the wing folded accidentally, then while winding, the fuselage splintered., By flying his old Wakefield for the last flight, he won the meet.

Robert Provart, engineer for Northrop Aviation, A/1 towline glider, 13.3 aspect ratio—named Counterfeit.

Marvlyn Taylor launches husband Carl's canard Nordic A/2 towline glider. Carl flies canards in all Gas and Glider events.

Bob White, with brand new Wakefield, using a Bill Bogart airfoil from the 1971 NFFS Symposium report with turbulators. Motor tube is two layers of fiberglassed 1/16 balsa.

[redacted] Bellinger rests on his [redacted] 40RR-powered Gysob 1000. Repeated 1971 performance by winning Class C Gas. Motorcycles are standard retrieving aid in the West.

Walter Prey and his 1200 sq. in. Class [redacted] model, called Drag-Gon. K&B 29 engine, 51 oz. total weight. Very light for its area, but heavy for its engine size. Has sliced-rib wing construction, undercamber. Model has fantastic glide and mild climb—a departure from current trend toward climb-emphasis machines.

Ernst Johnson, Old-Timer Rubber event winner. Model is Bruce Lucket's 1936 Mulvihill Trophy winner—span 32", wing [redacted] 120 sq. in., six strands of 3/16 Sig contest rubber.

"Tommy-T" Peadon fires up Rambunctious by Coleman light for Night Flying, a popular event at Western meets. He won second place with a K&B 40.

George Xenakis had four Wakefields with torque-actuated stabilizer trim. Used homemade air temperature recorder ▬ thermal-detecting aid. After getting the hang of detecting California thermals, he maxed on three of his five Wakefield flights.

Bob Isaacson flew this Unlimited Rubber model in the flyoffs while also participating in Nordic flyoffs—quite a busy man.

Jef Cunnyngham, age nine, son of Vic Cunnyngham, Jr. Model is ½A Mini-Pearl, Bill Chenault design, M&P kit. This ▬ his first flight with a gas model in a contest—he maxed.

Bob Oliver's FAI-Power model, fiberglass tailboom, sheet balsa covered surfaces. He has built four models of this design, and is strong contender for FAI team.

Gerry Geraghty pumps every possible ▬ of energy into the quarter-pound motor of his Unlimited Rubber model with assist from father Steve and ▬ Vanderbeek. Gerry won Junior Sweepstakes last year, Senior Sweepstakes this year.

Peter Allnutt, twice winner of the A/2 Towline Glider event at the Nats, came from Toronto with Andy DeMello and Tam Thompson. Note the unofficial T-shirt sold by Dick Mathis to finance trip!

Photos by Bob Meuser

The Weather: Contrary to the popular non-California FFer's notion, it isn't always dead calm with bouyant air where maxes land at your feet. The wind blows from all directions during the day and sometimes is gusty. Even the night flying event found a fresh breeze blowing the best-lighted ships to the limits of visibility in five minutes. The afternoon thermals are strong, especially for ½As and HLGs, making for long chases even after dethermalizing. The downdrafts are there too, even early in the morning. One can't automatically count on good air unless he picks it.

The heat on Sunday was something else. It was like a furnace—with some reports of the temperature reaching 120 degrees. Fliers were forgetting about flying events they had prepared for just to get out of the sun. Sal Taibi remarked that it was the hottest contest he could remember in his career, which must date back to 1812. The heat didn't keep Sal from being his usual competitive self, though—he got fourth place in Payload with one of his Eaglet sport FF kits.

(Continued on page 72)

LOUGHEAD
Sport-Biplane Model "S-1"

A replica-in-miniature of the most technically advanced biplane of all time. Model includes all the real plane's unique features, too.

Plane on the cover

MONTY GROVES
SUNNYVALE, CALIF.

SPORT-BIPLANE—WINGS FOLDED

One can become addicted to early aviation research. After researching and building a model of Wiley Post's beautiful Winnie Mae (August 1970 AAM), we became interested in the aircraft immediately preceding the Lockheed Vega. Precursor to the Vega was the Loughead Sport-1 biplane, and research into this little-known one-of-a-kind aircraft has been an engrossing and fascinating project.

Though built and flown 52 years ago, with the exception of Allan and Malcolm Lockheed, most of the original participants are still with us. And without their cooperation, the S-1 project would never have gotten off the ground.

During the Vega research we came across six photos of the slender little bipe. With these and five or so others located in the Lockheed-Burbank files, we began the project. After two years of constant correspondence and probing into various personal and public archives, some 55 construction and flying photos have been amassed. The original 1920 Loughead sales brochure, as modified, provided all the dimensions. Interviews and correspondence with Jack Northrop, the principal engineer, Tony Stadlman, the shop superintendent who built it, Gil Budwig, the original test pilot, and several others provided an almost complete story.

One of the more exciting side effects of historical aviation research came the day my wife and I drove home with the original, one-and-only, two-cylinder engine, its propeller and spinner ring. The S-1 engine, which had dropped out of sight for over 30 years, is slated to go to the Smithsonian as soon as it's overhauled and test run, providing I can locate a Master Carburetor.

Since no original drawings have been found, the drawings with this article were generated over a long period of time, and are based on the photos, published dimensions and review by the men who created and flew the S-1. Data and photos are still being located, so the search will continue.

The Loughead S-1 had several unique design features—an elliptical molded, monocoque fuselage, and for lateral control the entire lower wing pivoted at the root. After landing and during the landing roll, the pilot could disengage the lower wing and pivot the *entire* lower wing 90° to assist it in braking to a stop. The wings folded up so that the plane could be towed down the highway and stored at home.

The configuration of the model of the Loughead S-1 is scale, and based on the 1:1's appearance at the 1920 San Francisco Aero Show. Like the original, the model is complete with folding wings. Since most of the flying of the real aircraft was done without the cheek cowls, these can be eliminated and you'll still be "scale."

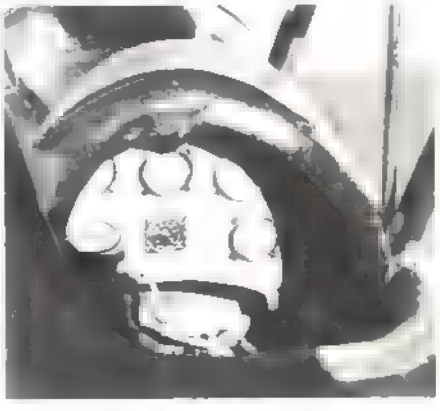
While the model has folding wings, they can be eliminated too, if you're concerned about the structural integrity of what appears to be (but isn't) a Mickey Mouse arrangement. The folding wings were built into the model to confirm the functional operation that the original designers intended and to further confirm that the dimensions and proportions were correct.

Except for the lateral control surfaces, which may seem strange but really are practical, the aircraft is conventional in configuration.

Construction

Wings: Wing construction is conventional with the exception of the trailing edges. To obtain the scalloped effect, use 1/32" wire, much the same technique as on the original. Small brass tabs are spaced two in. apart and soldered to the wire edge prior to attaching it to the ribs. This, coupled with the use of one-piece Super Coverite covering for each panel, provides the proper amount of shrinkage for the scale, scalloped effect.

That's all the instrumentation the real plane had, too, but arrangement of dials is only a guess.



The lower wing is built up using a spruce box spar which will carry the required loads when it's used for lateral control. The number of ribs and their spacing is scale with respect to the original. However, the airfoil still isn't exactly known, so the model airfoil is approximated from the photos we've collected.

The "V" struts, the cabane strut construction, and their installation are shown on the plans, and are easy to follow. The small fittings on top of the cabanes for wing and wire attachment are made from tubing and soldered to the cabane wire mounts before the wood fairings are attached.

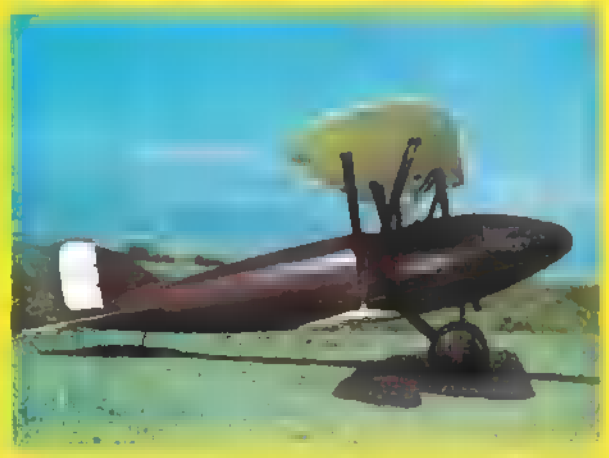
The plans depict a different leading edge than that shown in the construction photos. The more solid leading edge shown on the plans will tend to keep the wings from warping.

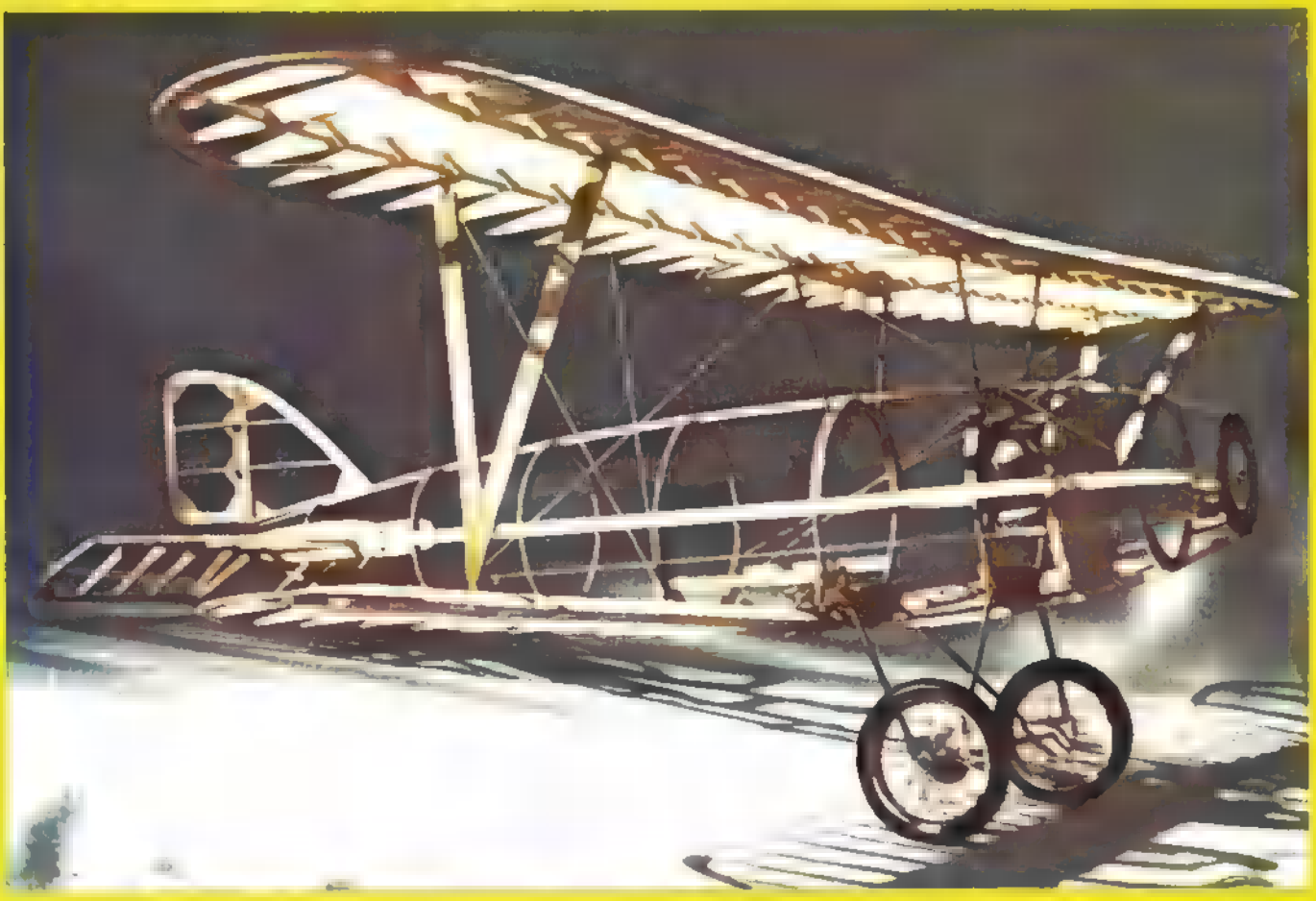
To cover the wings, cut one piece of Super Coverite to cover both top and bottom of the wing. Start at the leading edge and cover the bottom to the trailing edge; follow Coverite's instructions. With the bottom section now covered, continue up and over the top so that you end up back at the leading edge. Super Coverite provides additional strength to the wing, and the shrinkage can be controlled without getting out of hand.

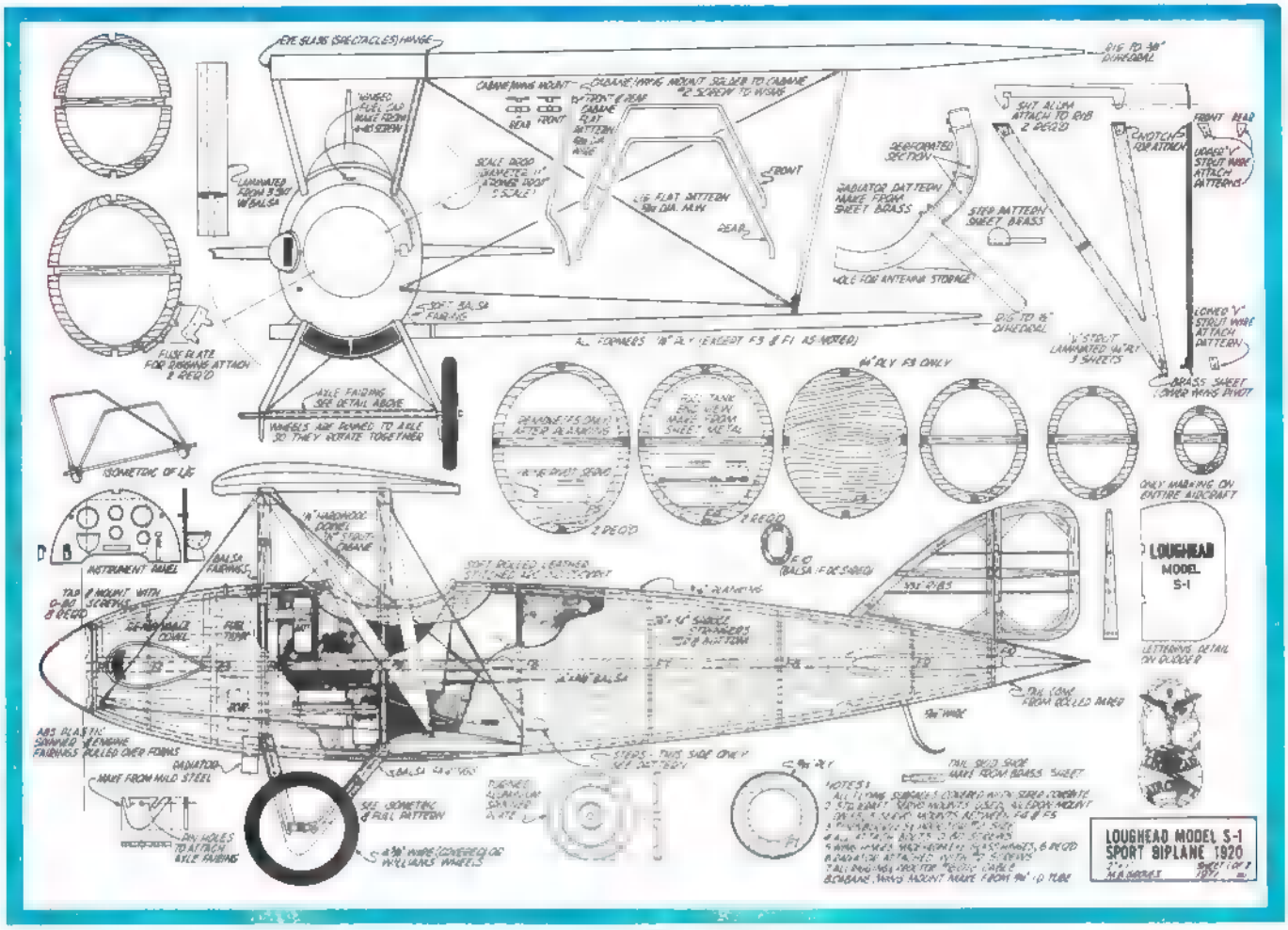
Fuselage and Empennage: As with the Lockheed Vega model, we chickened out in making a scale concrete mold for the molded fuselage halves. The model is planked over a preformed skeleton frame.

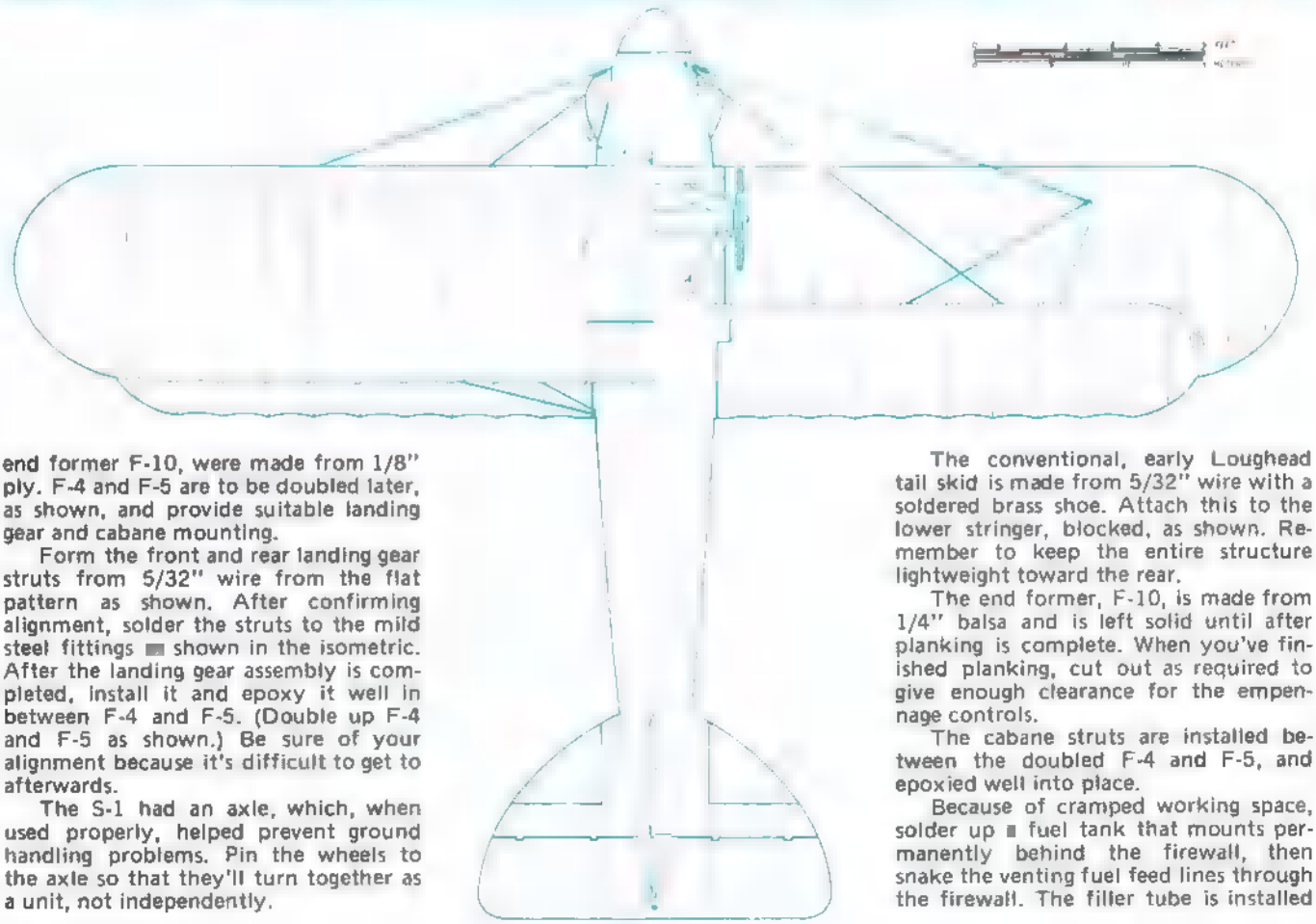
Unlike the Vega, which was made up of two identical symmetrical shells, the Loughead S-1 required two asymmetrical shells. (On the S-1, there's greater depth below the centerline.)

Construct a crutch, and attach the top and the bottom formers and stringers. This helps reduce the likelihood that you'll run into a fuselage warping problem, which is, as we all know, a giant pain in the neck. All formers, except for F-1, the firewall, F-3, and the









end former F-10, were made from 1/8" ply. F-4 and F-5 are to be doubled later, as shown, and provide suitable landing gear and cabane mounting.

Form the front and rear landing gear struts from 5/32" wire from the flat pattern as shown. After confirming alignment, solder the struts to the mild steel fittings ■ shown in the isometric. After the landing gear assembly is completed, install it and epoxy it well in between F-4 and F-5. (Double up F-4 and F-5 as shown.) Be sure of your alignment because it's difficult to get to afterwards.

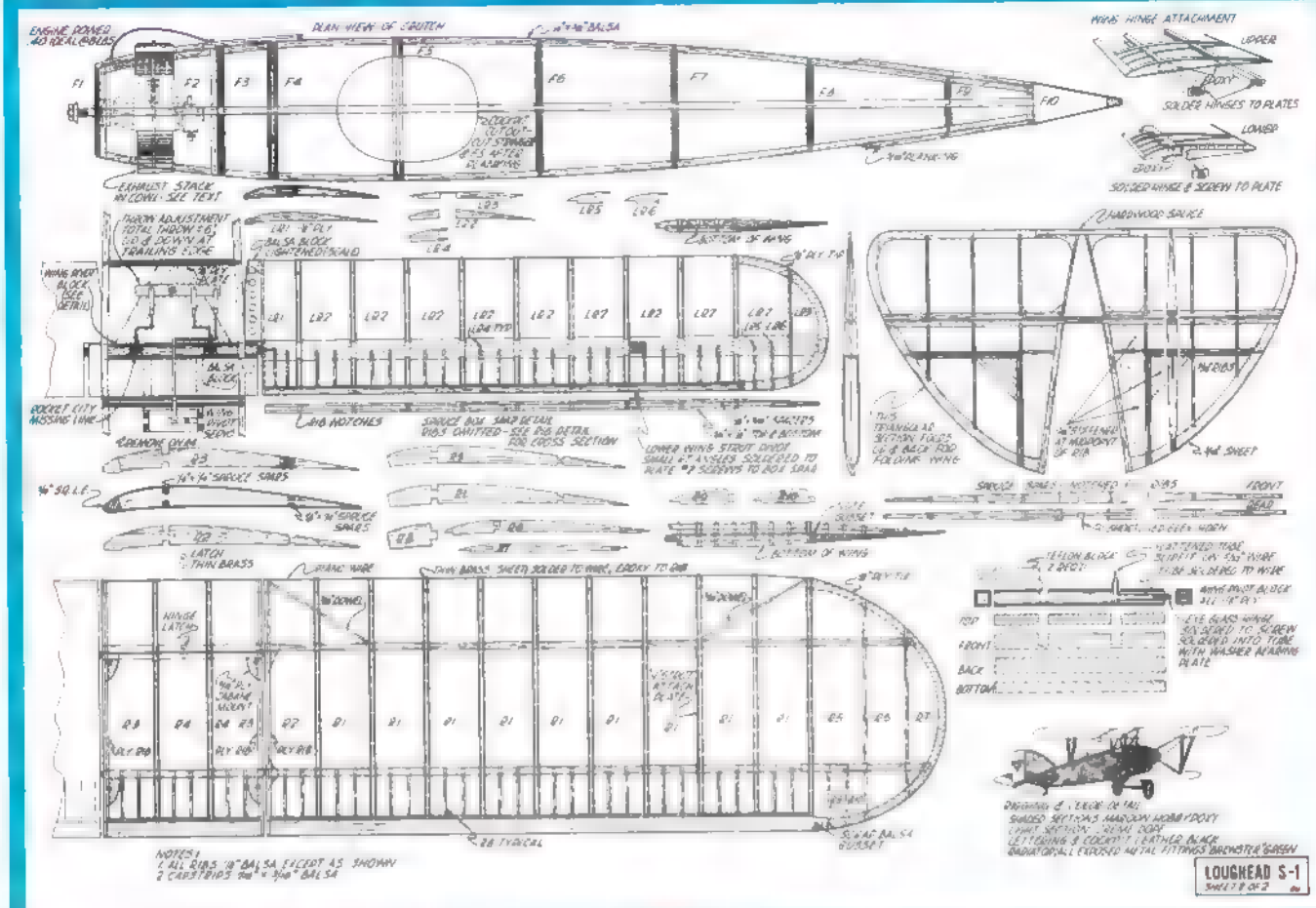
The S-1 had an axle, which, when used properly, helped prevent ground handling problems. Pin the wheels to the axle so that they'll turn together as a unit, not independently.

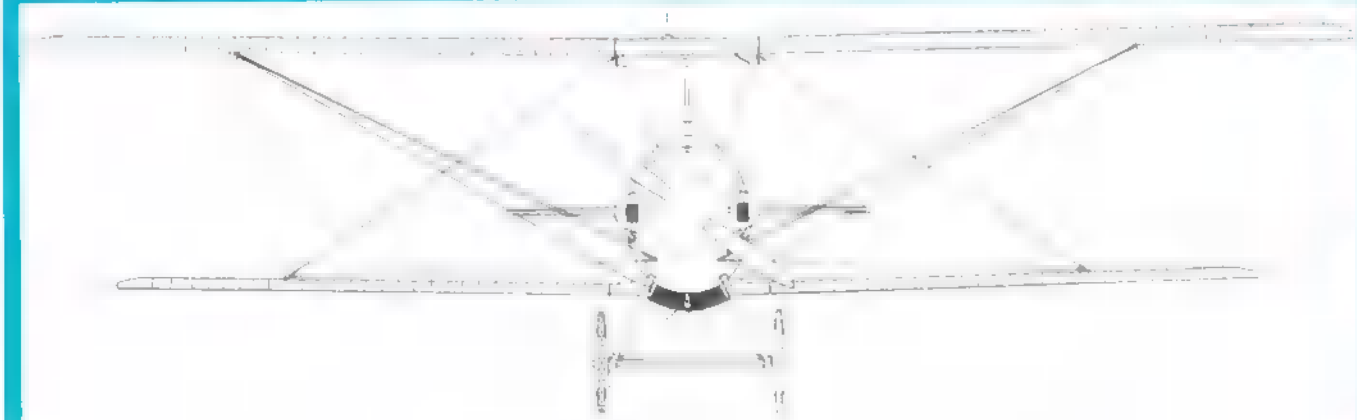
The conventional, early Lougheed tail skid is made from 5/32" wire with a soldered brass shoe. Attach this to the lower stringer, blocked, as shown. Remember to keep the entire structure lightweight toward the rear.

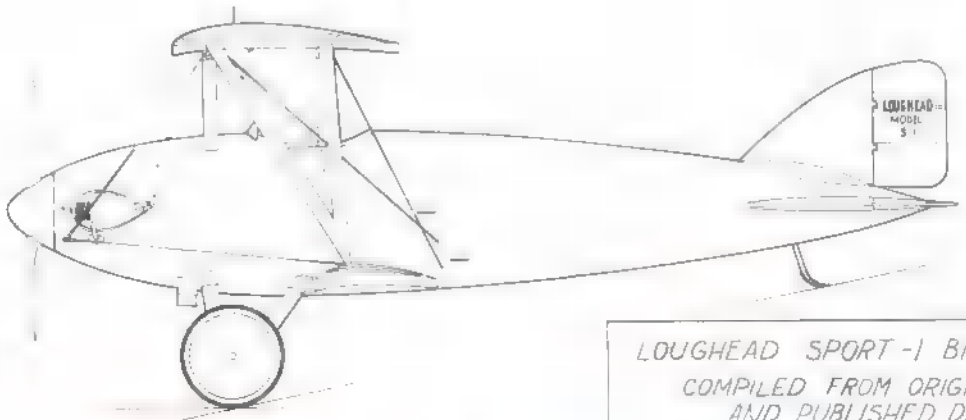
The end former, F-10, is made from 1/4" balsa and is left solid until after planking is complete. When you've finished planking, cut out as required to give enough clearance for the empennage controls.

The cabane struts are installed between the doubled F-4 and F-5, and epoxied well into place.

Because of cramped working space, solder up ■ fuel tank that mounts permanently behind the firewall, then snake the venting fuel feed lines through the firewall. The filler tube is installed





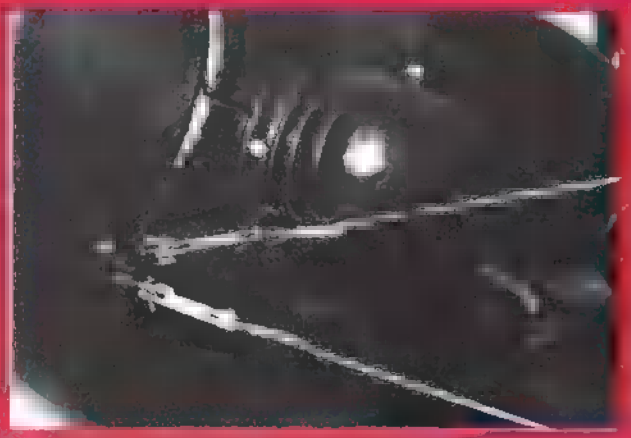


LOUGHEAD SPORT-1 BIPLANE 1920

COMPILED FROM ORIGINAL PHOTOS AND PUBLISHED DATA

• M. B. GROVES JUN. 1970

FULL-SIZE PLANS AVAILABLE—SEE PAGE 84



up through the top of the fuselage, and is threaded to match a 4-40 screw which was modified with a butterfly head. (On the real S-1, this screw cap covered the water tank to the water-cooled engine.) Be sure to completely check your homemade tank for leaks before installation.

Because of limited space I selected a rear rotor, Supertigre 40, with a Perry carb to improve idling. Mount this to a wooden rail mount of your own design. Attach the rail mount to the firewall with No. 6 blind nuts with Allen head screws.

The ST 40 is mounted flat with the cylinder out the right side for cooling. This places the exhaust downward. A friend of mine, who has access to such things, provided some flexible beryllium copper wave guide material for the exhaust stack. This was attached to the engine exhaust, folded under the engine, and directed out to the left side (opposite the cylinder). Thus, the now somewhat muffled ST 40 is a deep-throated powerhouse. (If you don't have access to wave guide, silver solder up something similar.)

The lateral control provided a unique challenge to implement, and while it eventually worked like a charm, it gave us all sorts of headaches until Jim Sunday, famous local "test pilot" and bosom chum, came up with the clever concept shown on the plans.

The wing pivot block, which provides the lower wing support and pivot drive, is a ply structure with the pivoting assembly supported in a Teflon block. There's no way that this can bind. The pivot block is installed and blocked in as shown just aft of F-5. Check for alignment and centering. The total movement of the lower wing is only 6°. *It must be positive* with little no slop.

The lower wing is attached to this pivot point by scrounging some eyeglass hinges from your local optometrist. The lower wing is held on with the screw that holds the hinges together. Carefully solder each side of the hinge—one side to the plate which you've epoxied and screwed to the wing, the other side to the pivot shaft in the block.

Provide two additional balsa formers up front around the engine compartment: in front of the firewall, F-3, and one behind the front ring, F-1. Force them into place between the crutch and glue to the top stringer, but do not glue to the crutch or F-1 or F-3.

You're almost ready to plank. But first install your servo trays, and check out your servo action the lower ring pivot and throttle. I used standard servo mounting trays mounted to hardwood rails between the formers.

Now, plank! For ease of assembly, the 3/16" planking strips should be cut to 3/8" widths. After planking and preliminary shaping and sanding, finish the fairing around the lower ring pivot block with soft balsa blocks. Now's also the time to fair in the landing gear and cabane struts. (Check for fuselage warping as you glue, pin and plank.)

Attach and glue the Super Coverited horizontal stab to the fuselage. This should be done with the elevator attached to insure proper operations. Now glue the vertical fin directly to the fuselage after squaring it with the stabilizer. Cut out F-10 and connect the rudder and elevator controls.

Lay out and cut the planking for the cockpit. This requires cutting through the top stringer and the doubled F-5. Use your razor to cut F-5 vertically.

After some additional sanding and filling, cover the entire fuselage with Super Coverite, using longitudinal strips overlapped. This adds unbelievable strength and cuts finishing time by more than half.

Up front, cut out the cowling using a razor saw to cut vertically between the formers F-1 and F-3 and the extra unglued balsa formers. Now cut horizontally along the top of the crutch between F-1 and F-3. And out pops a cowling!

Cut out the cylinder and exhaust areas, and install the engine and exhaust.

Fittings, etc.: The S-1 had a nonstandard Albatros, Halberstadt, rounded-type, Snyder-type spinner. To achieve this miserable shape, heat 1/8" ABS sheet plastic, and pull over a turned form. The ABS plastic spinner is mounted to the aluminum spinner plate with 0-80 screws. Cut out notches on either side of the plastic spinner for the 11" wooden prop.

Cheek cowls, if used, can be made in a similar manner to that of the spinner. Just remember, you've got a double compound curve over which it must fit.

The removable instrument panel is made from ply. Using double sticky foam tape, mount your battery pack to the back of the panel. Sprinkle the

panel lightly with the basic instruments: airspeed, throttle (right side), oil pressure, water temperature, altimeter and compass. Other than the type of instruments used and the location of the throttle, the exact panel layout is not known at this time.

The bottom of the pilot's seat is made from balsa and the back is made from shaped cardboard. The whole thing is covered with an old, thin piece of scrap leather.

The tail cone is a piece of bond paper that's been rolled and glued with a balsa plug. Attach the tail cone to the fuse with pins.

The windshield frame is brass. A single piece of butyrate plastic windscreen is set in the frame and attached to the fuselage.

A soft, old, bought-in-Hong Kong leather wallet was used for the padding around the cockpit. Contact cement will attach it around the cockpit. Then stitch it through the planking and Coverite to hold it securely and, at the same time, give it an authentic appearance.

The original S-1 had wire wheels with fabric wheel covers. Use four circular disc pieces of *old* sticky Coverite. (Cut a 1/4" axle hole.) Very carefully remove the tire, place the Coverite over the wheel, and press the Coverite discs up and over the edge of the flange, one for each side. Carefully replace the rubber tire. This will hold the cloth discs in place while they're being painted. The wire spokes tend to press through the cloth covering which provides that little extra touch of realism.

Using the pattern provided on the plans, solder up the underslung radiator from a piece of sheet brass. Attach it to the fuselage with 0-80 screws. Incidentally, use the inside of the radiator to stow your antenna when you're not flying.

Rigging: Proctor turnbuckles are used in the rigging, one on each wire. When rigging, be sure there's zero incidence in the wing with respect to the stab. Allow no twists in the wing, and, by all means, safety wire those turnbuckles. (I test ran the engine once without safety wires, and thirty minutes later I was still looking for pieces and parts.)

Paint and Color Scheme: The S-1 had about as simple a color scheme as you can imagine. Wings, elevator and rudder are cream. The fuselage, wheel discs, spinner and horizontal stabilizers are maroon. Both the cockpit leather and the lettering on the rudder are black. And paint that radiator Brewster Green—or you'll get a thorough Czechoslovakian tongue-lashing from Tony Stadlman. (Stinson Green, as packaged by Pactra, will do nicely.)

Use butyrate dope for the cream surfaces and Hobbypoxy for the maroon. You'll have to mix all colors. As for cream, it is cream, Insignia White plus a little yellow. As for the maroon, this nondescript color just about brought our happy marriage to an end. Mix maroon, call it Maroon, and stick to it! The color that best matches is the same as fresh beef liver. How about that reference?

The one-and-only Loughead S-1 engine and the one-and-only Tony Stadlman meet again in San Francisco. As Loughead's factory superintendent, Tony's support in this research project has exceeded all bounds.

Wing Folding and All That Jolly Fun: Now if wing folding is your bag, then have at it. But after this experience, it's no longer mine. Disconnect the two drag wires at the nose on each side. Remove the two forward screws on the upper wing. Fold up the center section and the triangular folding sections on the stab. Reach inside and slip off the two vertical pivot drives. Then fold the lower wing 90°, trailing edge up. Now each wing assembly can pivot toward the rear. (And when I think of all the sweat, well, never again.)

Center of Gravity: With respect to CG, after much debate we decided to ignore the small lower wing and place the CG as shown.

When I'm building, I have a tendency to get a little tail heavy (as well as on the model), so I had to add a removable lead horseshoe around the engine. If you have to add such a mass, be sure that it's well secured.

Flying

With an 11" power prop and the ST 40, we took it to the field and fired it up. Cameras at the ready; fingers, etc., crossed, we watched Jim Sunday start his take-off roll. Man, straight as a die. Up and out.

Jim was a little concerned about using the lower wings for lateral control, so he didn't plan to try them until he'd gotten up a little higher. But just after it broke ground, it started a very slight roll to the left. Jim hesitantly and cautiously applied the correction. It worked!

Then, up and around the pattern. For the benefit of all the highly-skilled photogs, he made several circuits. High-speed passes. Low-speed passes. Around and around and around until my suggestions to "bring it in, Jim" were borderline violent.

"Ya know," he laughed as he made one more circuit, "a guy could get addicted to this little wing-pivoting toad."

Then lining up for the approach, he throttled back and the engine quit cold. (This, due to a minor pre-flight adjustment.) On in she came, then touched down just like it was supposed to. Those pinned-together wheels are the only way to go.

After congratulations all around, it was discovered that the only problem was none of the ground cameras were working. So, confident with our S-1, Jim did it all again, and when I became certain he was determined to run out of gas, I had to threaten him to bring her down.

Epilog

Shortly after the second flight, we discovered a leak in the fuel system and my receiver was soggy. I got my radio out of there in a hurry, and we hung up the S-1 in a place of honor in Jim Sunday's hobby shop.

One evening, a few weeks later and just before Christmas, Jim was open late. Along with the fact that it hadn't been exactly a banner-type day, Jim was alone in the shop and hadn't had his dinner. He was feeling less than jaunty-jolly when a young guy strolled into the shop and started the normal I-just-came-in-here-to-kill-time casual gazing around looking at all the "toy" airplanes hanging from the ceiling.

Jim folded his arms, leaned up against the wall and watched the guy through heavy-lidded eyes. The young man looked at the S-1, and then after making a few rather cool remarks about it, he said, "Is that thing supposed to be scale?"

The eyelids crank up. "You bet it's scale. That airplane is exact. And anyway, who're you?"

"Oh, I'm sorry. I didn't introduce myself. I'm Allan Lockheed, Jr."

Not only do poor beleaguered hobby shop owners have to put up with so-called scale experts all the time, occasionally they have to endure practical-joking friends, ex-friends, and, oooh, it was beauty-full.

A little sport biplane was Loughead's first aircraft. Only one was made, yet it directly influenced Lockheed designs for the next twenty years.

PATRICIA GROVES

Before the end of World War I, the Loughead Aircraft Manufacturing Co. of Santa Barbara, California—like other aircraft companies the world over—began planning for the expected post-war boom in aviation. Long before space age market research-type terms had been thought of, Allan and Malcolm Loughead (Allan legalized the phonetic spelling of the Loughead family name in 1934), Jack Northrop and Tony Stadlman got all their marbles together and thrashed out future options.

Since the autumn of 1916, when it began in ■ corner of Bill Rust's garage, the Loughead Co. had expanded all through his shops at 101 State St. America was at war; investors and townspeople enthusiastically supported their local aircraft company and the men employed there.

When Allan and Tony entered into the wildly expanding aeronautics industry in Chicago in 1910, the industry, as such, was a mere fledgling. It was a game, but a serious one. And, often, for keeps.

Then, when Malcolm Loughead and Jack Northrop entered the field ■ few years later, they—like Allan and Tony—brought prior practical experience in automotive and mechanical engineering with them. By 1918, all four had witnessed aviation's phenomenal growth in the nearly 15 years since Kitty Hawk.

In September 1918, when destiny finally brought them together in Santa Barbara, the chemistry of their individual growth experiences, abilities and personalities catalyzed into a team. Over the months that followed, they quickly developed their own system of balancing out individual pluses and minuses—a creative bloodletting that would lead to the Sport 1 Biplane.

Within the context and course of daily work, the postwar possibilities were discussed, debated and decided on. A new aircraft, designed to fulfill the desires yet fit the abilities of the mass of wartime pilots then being turned out by the military, was eventually proposed.

With this as the basic criteria, what was wanted was an honest airplane—easy to fly, and priced so anyone could afford it. It had to be strong and durable, easy to maintain, and inexpensive to operate. To compensate for the lack of airfields and hangar space, this new aircraft would be storable in any ordinary garage, and easily towed behind a car. And so that it could be flown out of the fields that were available, it would have short takeoff and landing characteristics.

With the requirements established, the group grappled with design possibilities and construction methods. Of the then current fabricating techniques, the monocoque type of construction received a vote of confidence—if only it weren't such a flippin' pain in the neck. Then, with Malcolm supplying the initial impetus, the team worked out a new process. Eventually patented, the Loughead/Northrop/Stadlman development was the first practical attempt to apply plastic methods to aircraft construction.

Prior to this development, manufacture of wood-laminated fuselages was an expensive and time-consuming operation because individual thin strips of wood, butted together, had to be laminated by hand over a series of elliptical forms. Since the adhesive on the first layer generally set up before succeeding layers could be applied, it was impossible to subject the whole structure to a uniform pressure to achieve the desired weld. Sometimes the whole affair wound up pinging and twanging asunder before the total operation was complete. And about the only "production" then was more and better ways of swearing.

Not only was it a frustrating operation in itself, but all too often separation occured either between the butted-together strips and/or the layered sections—frequently at the most inopportune moments, such as during mid-flight.

The method the Loughead group developed was a process in which individual thin strips of wood are fitted to the surface of ■ male mold so that the strips, as a unit, can be temporarily fastened to a removable form. Then, secure in this removable form, the completed layer is removed as a unit, ready for use at any time.

When ■ fuselage is wanted, the desired number of prefabricated diagonal and longitudinal layers, or units, is selected. The already prefabricated first layer is nestled into ■ concrete female mold and thoroughly slopped with an adhesive. Next a layer of binding cloth is placed on top and painted with the adhesive.

A second prefab unit, put in place and coated, is followed by more binding cloth. After this layer of cloth is coated, the final wood layer is added. The completed ply is then subjected to intense and uniform pressure until the glue is set, after which it can be removed as a unit to be dried. This method produces ■ uniformly thick shell in which all control cables and horns can be totally enclosed within a fuselage.

After months of jawboning and experimentation, Allan, Malcolm, Tony and Jack created the product: a neat little biplane and ■ whole new construction process. When the dimensions were finally established, Jack got down to

S-1 is cover girl for May 1920 issue of *The ACE*, a California-based aero magazine.

Photo by Jerry Edwards

serious drafting and Tony began work on the concrete molds. Since the S-1 was asymmetrical in shape, two molds were built.

When engines were needed, both European and American makes were researched. A small, economical power plane was desired—a simple, uncomplicated engine made from easy to maintain and service standard parts. Overall, every aspect was considered in order to make maintenance and operation of the proposed S-1 a one-man job. It would be the ideal airplane, an all-Loughead airplane. However, to insure the success of the total venture, the group considered purchasing an established four-cylinder inline to be used in the prototype aircraft until a Loughead engine could be fully developed and tested.

By May 1919, a nation-wide Return to Normalcy campaign was in full swing. Even though aviation flourished—records broken, "firsts" being made—the aeronautics industry slipped into financial doldrums. Industry-wide, there were layoffs, cut-backs and major changes in direction. Investors cooled. But even though set adrift in these economic horse-latitudes, the boys at Loughead tightened their belts and staked their remaining financial resources, and future, on the Sport Biplane.

In the months that followed, final engineering and construction began on the forms, the molds, tools and jigs, on all the things that would be needed to go into aircraft production. For the moment, work on the prototype engine was put on the back burner.

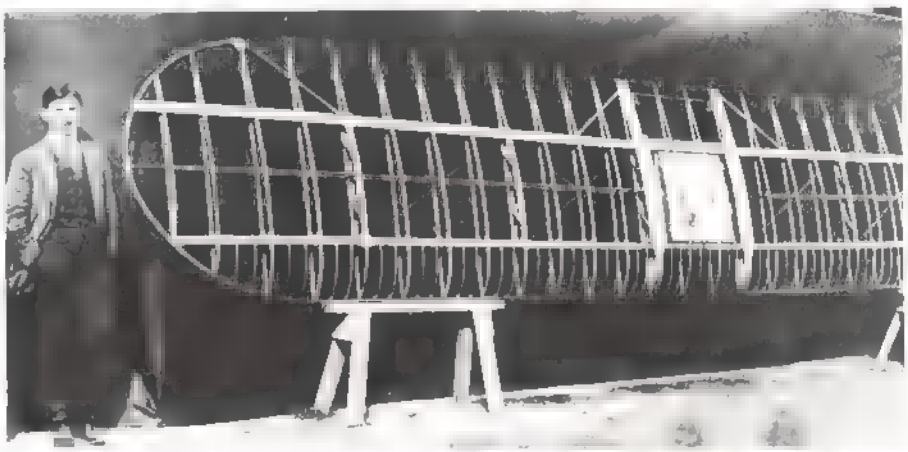
Shortly after New Year's 1920, news of an air show planned for that April reached the Santa Barbara shop. Loughead quickly reserved space for the S-1 to debut at the San Francisco Aeronautical Exposition. And now, with a definite target date to shoot for, the company went all out. The decision was made for an all-Loughead airplane *now*. Let's not wait. And immediately, Allan and Bill Rust began pulling ■ engine together.

As the S-1 neared completion, the company looked for ■ experienced experimental test pilot. They found Gilbert G. Budwig practicing his chancey trade in Venice, California. But before making his decision to accept the job, Bud drove up to Santa Barbara to check over the new airplane. He'd already heard a lot about "unusual innovations" and, before risking his neck, he wanted to see what he was up against. Bud had a long-standing habit of examining the engineering and construction on any new airplane. A calculated risk is one thing, being ■ damn fool is something else.

The design of the S-1's lower wings performed two unconventional functions: Instead of ailerons, each lower wing pivoted where it connected into the fuselage providing lateral control. Secondly, a special control lever allowed the entire lower ring to rotate 90° (after landing) and function as ■ very efficient air brake.

(Continued on page 95)

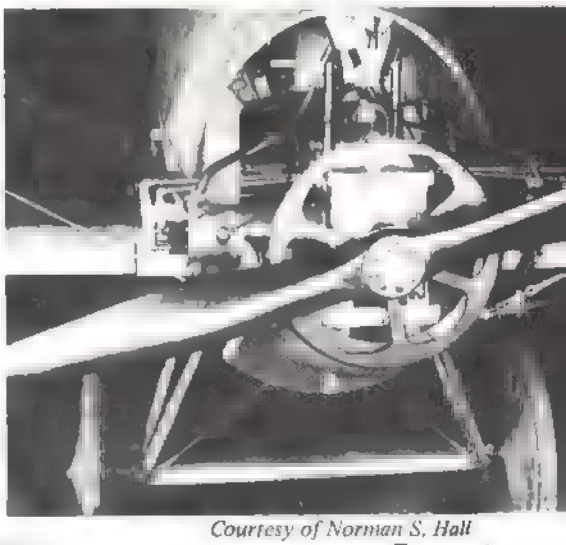
Courtesy of Norman S. Hall



Courtesy of Tony Stadlman

Top: In San Francisco's Civic Center, film starlet Mary MacLaren imparts some 1920s-type pulchritude to S-1, and a little publicity for the April Aero Show.

Above: Loughead Shop Superintendent Tony Stadlman beside the newly-completed upper wing structure of the S-1. A few years later, Tony would ram-rod the development of the Lockheed Vega.



Right: The 92-lb. Loughead engine fits forward the firewall with room to spare. Dual inlet, exhaust, magnetoes, oil pumps.

Below: Roll Out Day! Weighing ■ at 400 lb., the Loughead S-1 exercises her (lower) wings.

Courtesy of Norman S. Hall

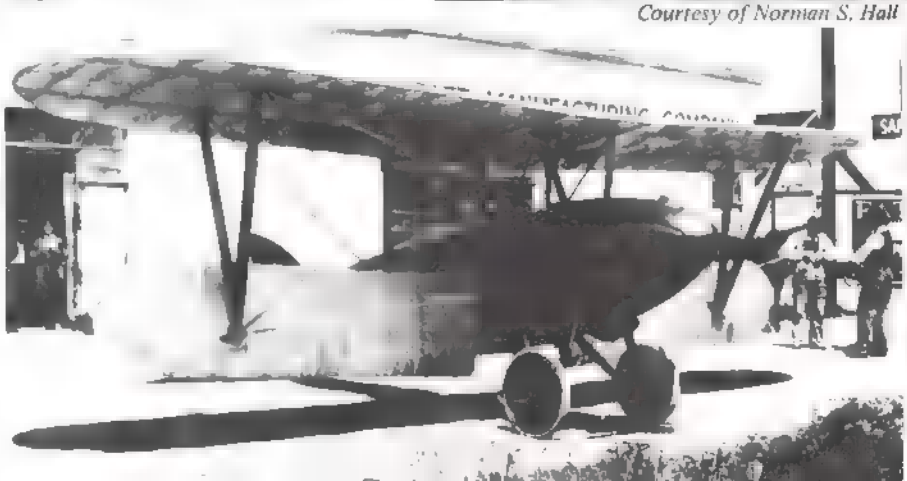
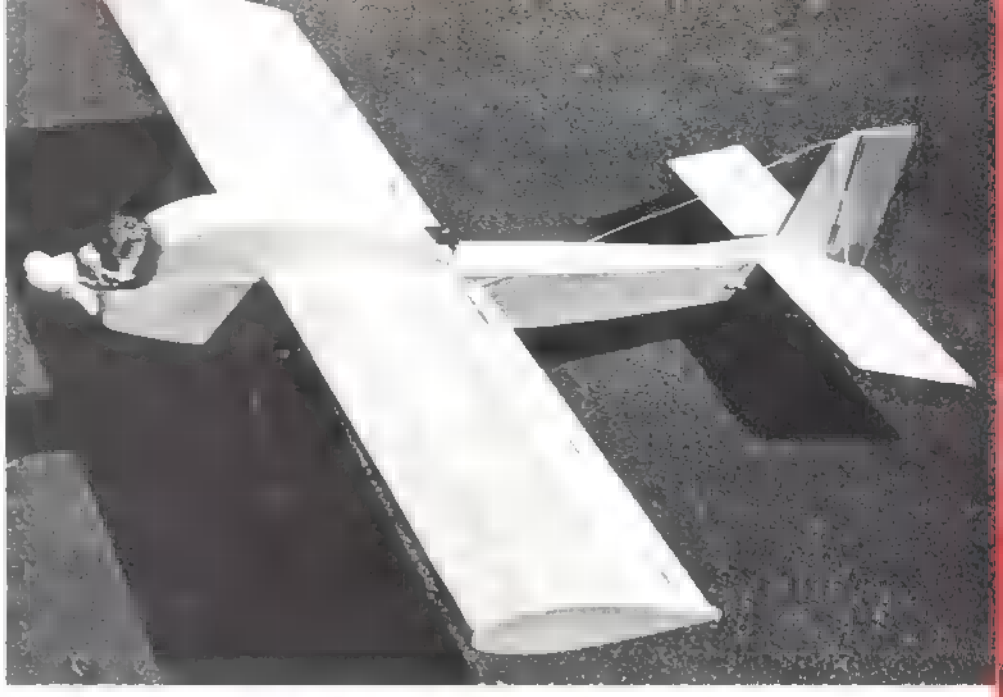


Photo by William L. Rust Collection

THE HUNCHBACK OF MODELING. WITH ONLY A 35 IT IS AGILE, SMALL, AND PERHAPS A BIT UGLY—BUT QUITE FUNCTIONAL.

Quasimodo

JOHN BURDICK

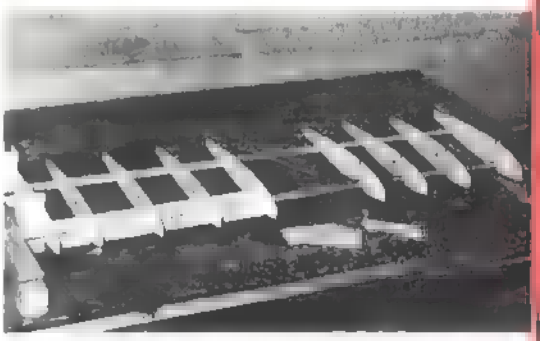


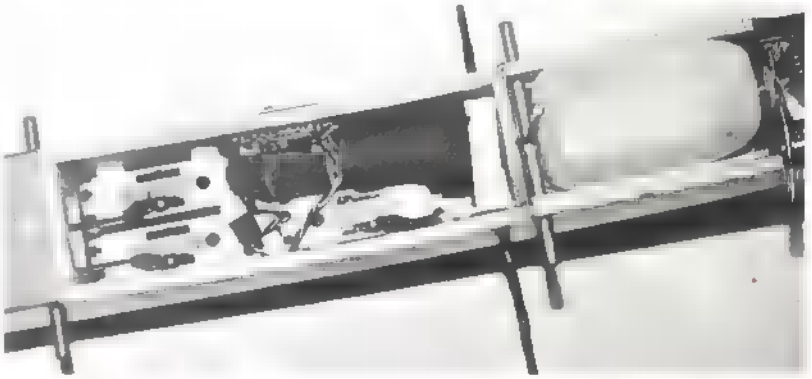
Above: The top box houses fuel tank and aileron servo. All alignments are zero-zero for good aerobatics.

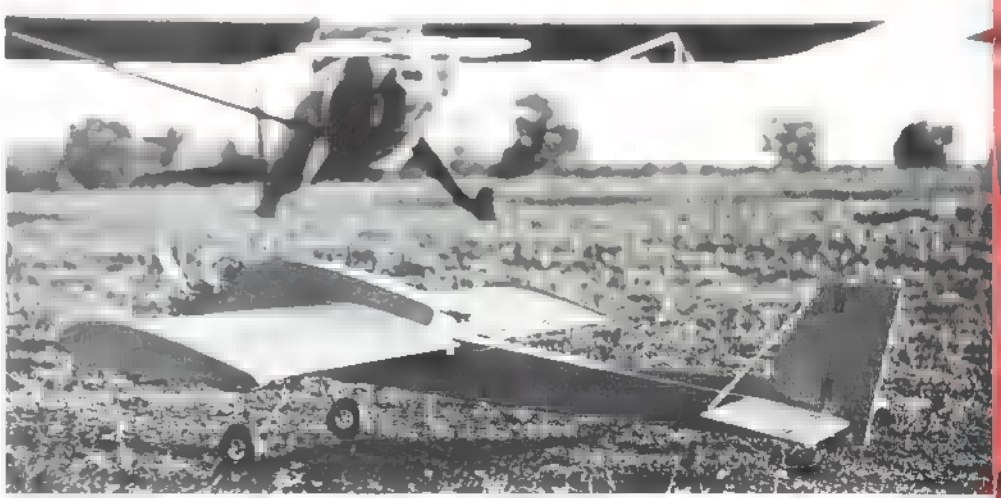
Right: Wing built of aluminum rods bought at hardware store's Reynolds Aluminum display rack. Sears has them, too. Keep the rods straight and your wing will be true.

Below: Fuselage houses Heathkit system easily. Hatch hold-down is from bicycle spoke attached to front wing dowel.

Bottom: Posed with a lovely Luscomb, Quasimodo shows her unique lines. Two-wheelers are always fun.







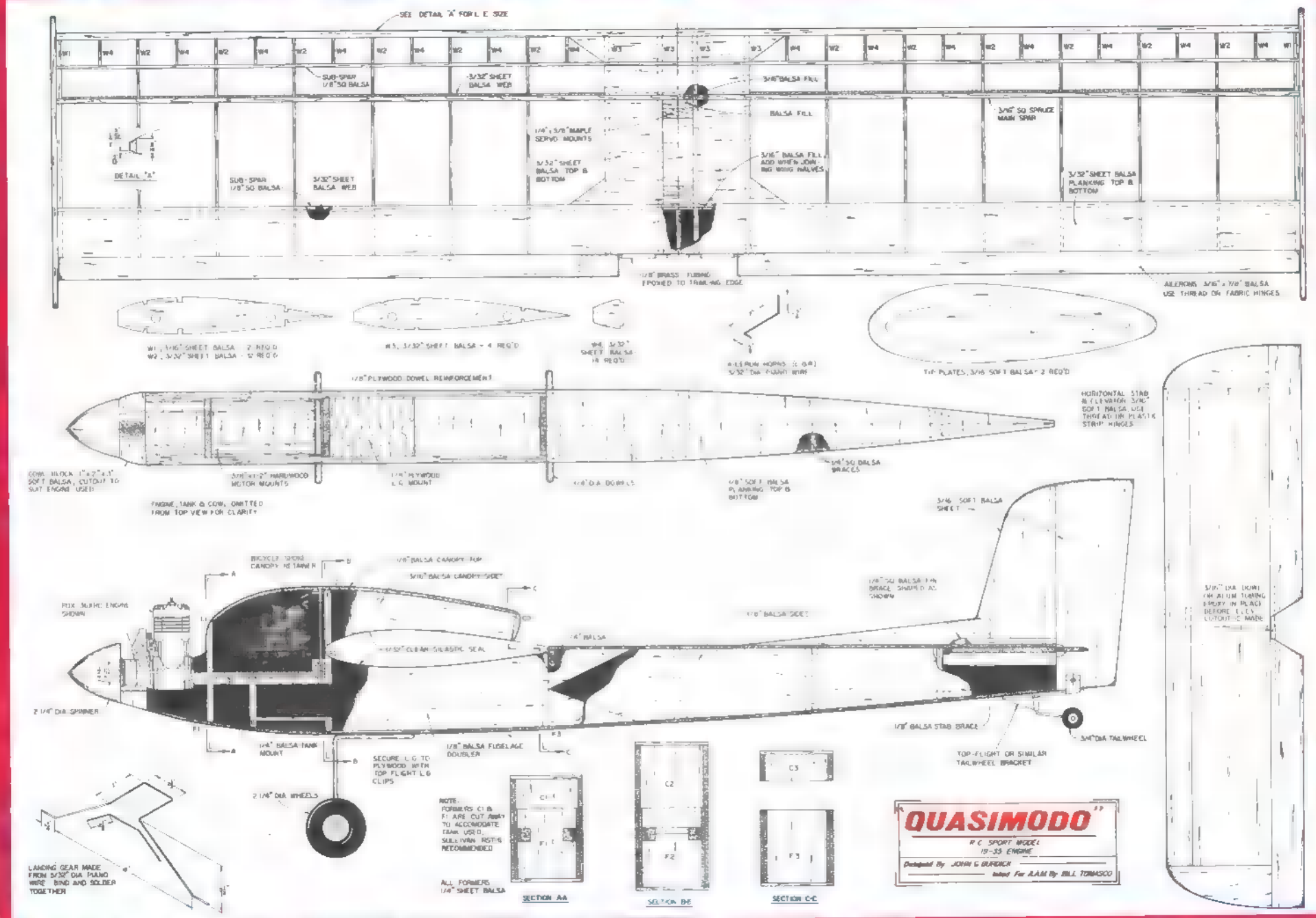
The basic design for the Quasimodo series was developed during a rainy vacation. I started sketching what I wanted. A 40-sized sport ship that would incorporate the following features: medium size, light weight, construction ease and good aerobatic performance. After a lot of doodling, an airplane began to take shape. A simple box fuselage just big enough to hold the radio gear, shoulder wing, high thrust line and zero-zero-zero-force arrangement. Sheet balsa tail group, straight-edge flat wing with my favorite modified Ritz airfoil, tip plates, and construction heavily influenced by "Das Ugly Stick." Long, wing-mounted landing gear and, finally, a bubble-shaped cover for the tank and aileron servo to avoid carving and (ugh!) sanding a turtle deck aft. I thought I would call this cover a canopy. Canopies are required for aircraft, right?

Functionally, if not esthetically, this seemed satisfying, so Quasimodo I was built. Its performance was up to expectations, but its appearance evoked such comments from fellow members of the Poughkeepsie IBM Radio Control and Model Club as : "Look at the wing wart!" and "What's that thing behind the engine?"

Keeping these friendly suggestions in mind, but not eliminating the canopy, since by now I'd grown used to it, I built a cleaned-up version—Quasimodo II. The second ship had conventional tips rather than tip plates. The long landing gear had proven too flexible, so LG location was changed to the fuse bottom. This was a fine performer, but on its tenth flight it executed a rolling figure seven and left me with nothing to fly.

To get back into the air quickly I decided to shrink the design to 35 size and simplify it as much as possible. I like to fly with a power loading of about ten lb. per cubic in. displacement and a wing loading of 18 oz. per sq. ft. This dictated a three sq. ft. wing which was laid out first, and the rest of the design scaled proportionately.

(Continued on page 96)



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10G16—Standard System '72	$71.95
10G17—Stomper System '72	$74.95

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FLITE PAK WEIGHTS & RECOMMENDATIONS

Complete weight of each unit and suggested application:

Unit	Weight	Recommended
Baby	2.5 oz.	Pee Wee .020 Up to 48" gliders
Baby Twin	2.7 oz.	Tee Dee .010-.020 Up to 72" gliders
Standard	4.4 oz.	.049 to .10
Stomper	4.8 oz.	Tee Dee .049-.23

ACE MINI FOAM WINGS

These jobs are being used by many and more modelers to come up with their own designs. See recent issue of AAM for P38 and RCM for Mr. Mulligan. Ideal for 1/2A Racing--and other planes of semi-scale or fun types.

Constant chord measures 35" span, 5½" wide, area 192.5. Weighs 3+ ounces.

Taper section is 35" span, center 5½, which tapers to 3"; area 166.25. Just over 3 ounces.

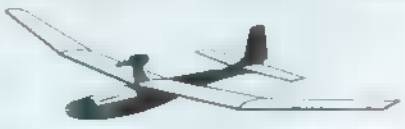
13L166—Ace Mini Foam Taper Wing	$2.95
13L192—Ace Mini Foam Constant Wing	$2.95

DICK'S DREAM KIT

Highly Recommended for Beginners

- 34" Foam Wing--Moulded sections
- Top grade die-cut wood parts
- For .020 engines
- Commander Baby or Baby Twin
- Owen Kampen design

No. 13L100—Dick's Dream Kit $6.95



ACE HIGH GLIDER KIT

- 70" Foam Wing -- Moulded sections
- Precision Machine cut and sanded wood
- For .049--Power Pod parts supplied
- Recommended for Rudder-Only Standard & Stomper Commander
- Owen Kampen design

No. 13L104—Ace High Glider Kit $14.95

SKAMPY KIT

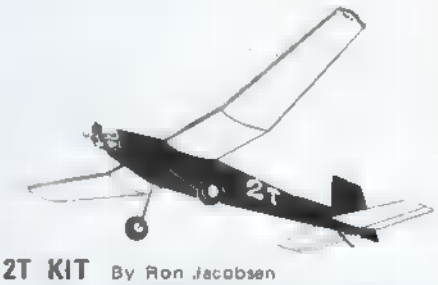
If you have mastered Rudder-Only pulse proportional flying, and are looking for new ventures, the Skampy is for you. Resembles a stand-off Goodyear Scale Racer. Owen Kampen touches in both the design and kit assures the experienced modeller of a satisfactory RO pulse experience. It is NOT recommended for beginners.

Has 30" span wing cut from Ace mini foam tapers. Construction of the fuselage is a bit harder than a box type, but still simple for modellers with experience. Fuselage is 23¾", recommended power is Tee Dee .020. Recommended radio installation is Commander Baby Twin. This makes total weight of 12 to 13 oz.

Kit contains taper foam wing set, precision band sawed and sanded top grade balsa and hardwood parts. Bent landing gear, wire for torque rod and plastic bearing, and hinge material is also supplied. Wheels and engine mounting hardware not included.

Full step by step instructions make this a simple job for the experienced RO flyer.

No. 13L103—Skampy Foam Wing Airplane Kit $6.95



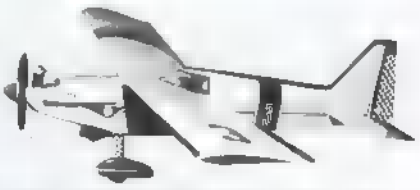
2T KIT By Ron Jacobsen

Uses two sections of the Ace Mini Foam Taper Wings, and one Constant Chord section for a total span of 60 inches, 262 sq. in. Coupled with an .049, the 2T was designed primarily for the two channel Brick type digitals that are on the market, or two servos of any digital system.

Also, when constructed correctly, it performs exceptionally well on Rudder Only using the Commander Standard or Stomper. Motor control can be added to at a later date by using the KRD motor control.

Kit contains three wing panels, all balsa wood completely band sawed and precision sanded, bent landing gear, and miscellaneous parts. Is of the same general high caliber as previous Ace kits. Hardware for hinges and linkage and wheels is left to the buyer.

No. 13L106—2T Foam Wing Airplane Kit	14.75
No. 13L206—Three Foam Wing Sections For 2T	5.00



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- .049 to .051 Tee Dee Engine
- Two channel operation
- Owen Kampen design

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- Receiver-Decoder works any modern digital servo.
- Receiver-Decoder offer inexpensive way to go with your present system for glider, plane, boat or car: with extra servos you already have. Or combo flite pak: receiver-decoder, two servos, etc.
- Available on the following frequencies: 27.995, 27.045, 27.095, 27.145, 27.195 53.100, 53.200, 53.300, 53.400, 53.500

digital commander
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(Less case, connectors, switch)
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digital commander
SERVO KIT

Housed in the D & R Bantam DS3P mechanics, uses WE 3141 IC for ease in assembly. Kit contains motor, pot, wiper and all components required, with step-by-step manual.

No. 14G20—Digital Commander Servo Kit $25.95

No. 14G20L—As above, except with D & R DS2P Linear Mechanics $26.95
(Less connectors)

digital commander
FLITE PAK KIT COMBO

If you intend to use Commander Digital with your multi digital transmitter, all you need are the receiver decoder and 2 servo kits. Combo offers savings over kits purchased individually. Includes 3 connectors, switch, hookup wire for cabling. Everything you need to make complete 2 channel 2 servo pack for your sailplane, boat or car, except batteries.

No. 12G30—Flight Pak Combo $69.95

No. 12G30L—As above, but with D & R DS2P Linear Mechanics 71.95

Please Specify Frequency

For complete listing of Transmitter and Combo Pak, Batteries, Packs, Connectors, components and PC boards--see our Handbook-Catalog. Price is $1.00 via BULK Third Class. $1.50 via First Class.

digital commander
TRANSMITTER KIT

IC's make the encoder a cinch, and easy conversion later to 8 channel. Built up to a standard of excellence, not down to meet a price. Complete kit with step by step instructions.

No. 11G20—Digital Commander 2 Channel Kit $49.95
(Please specify frequency)

COMPLETE KIT COMBO

Consists of Transmitter Kit, and all parts of the Flight Pak Combination and saves still more. Available initially on 27 mHz spots.

No. 10G2—Digital Commander Kit Combo $117.95
(Please specify frequency)

BATTERY & CHARGER OPTIONS

While alkaline energizers may be used for Flite Pak, Nicads are recommended--4.8 volts.

38K33—Nicad 225 ma Cylindrical cells	2.00
38K50—KRD Flat Pack for above (4)	1.00
38K35—Nicad 450 ma Cylindrical cells	2.50
38K8—D & R Square Pack for above	1.95
38K77—XL-ent 4.8v 500 ma button pak	8.98
34L10—XL-ent 225 ma charger kit	3.95
34L11—XL-ent 500 ma charger kit	3.95
34K22—Varicharger kit	7.95
34K21—Varicharger, assembled (Varicharger will charge both 225 and 500 ma and other packs)	9.95

No. 38K54—Mallory 1603, 9 volt Transmitter Battery 2.25

ALL STAR
BIPLANE KIT
Designed by Roman Bukolt
FOR UP TO .15 ENGINES

The ALL STAR Bipe by Roman Bukolt is a real winner--and will appeal to old timers and newcomers alike. Fashioned after some of the EAA home builts as well as the nostalgic planes of the 30's, this design overcomes most of the problems encountered in the building of bipe simple with easy construction of the N struts and cabane.

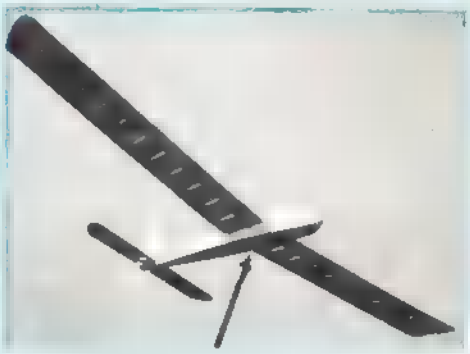
Modified Ace Foam Taper sections are used--again a simplification and an assurance of exact duplication of wings.

Span 34". Area 350 square inches. Designed for .049 to .15 power. Use with .15 and three channels, .09-.10 for two channel OR with .049 and Rudder Only Pulse! Truly an All Star.

Kit contains 60 precision band sawed and sanded balsa, spruce and ply wood pieces, sets of Ace taper foam wings, miscellaneous wire parts, and complete step by step building instructions. (Wheels and pilot not supplied.)

No. 13L200—Ace ALL STAR Deluxe Biplane Kit $21.95

TRY YOUR DEALER FIRST—if he does not have it, order direct using coupon opposite page for fast and courteous service.



Dear Friend:

Does that model above look familiar? To many a reader it will. It is the Nomad. This a design which quite a favorite a few years back, and thousands of modellers built it, and many of them learned to fly on it.

It has been resurrected by House of Balsa at Long Beach, California. Will be available by the time this ad appears in a considerably improved kit form, with top grade balsa all the way through, and with installation instructions for single channel. (Pulse Commander recommended!)

48" span, with a Baby or Baby Twin, and a Pee Wee .020, and you've literally got a bundle of fun on your hands.

This is our catalog No. 13L90-House of Balsa Nomad, $11.95.

House of Balsa also has a Shoestring designed by Fred Reese. This is a Quarter Midget stand-off scale. Uses .15 R/C engine with an area of 302 or 310 square inches with a span of either 35 or 37 inches. Glass spar wing. No. 13L88-Shoestring Quarter Midget Kit, $32.95.

The photo shows the new effort by Lee Renaud of Airtronics. Called the Questor 62, it's a 62" span, has 409 squares and weighs 16 to 20 ounces. For 2 channel operation. No. 13K85-Airtronics Questor, $26.95.

Airtronics Accessories: Can Winch, Tow Hooks, Wind Meter, and others have been added.

We are also adding Mark's Models Windward and their Windfree designs. These are both contest winners by Mark Smith. Either of the two foregoing at $22.95.

Apollo Model Specialties introduces the Adjust-Tow Hook. Designed for sailplanes of 2 pounds and up. One of those ideas that you look at and say "Why didn't I think of this?" Very simple, but extremely practical, and takes all of the hard work out of modifying and making something do the job.

Complete with metal strap with holes, adjustable tow hook and special keeper.
No. 36L335-Apollo Adjust-Tow Hook, $1.79

Peanut Scale by Peck Polymers are in with two cuties. These aren't R/C models but we couldn't resist them. The Pietenpol Air Camper with a 12" span 13L91 at $1.98, while the Miles M. 18, 13" span, is 13L92 at $1.98. Complete with nylon thrust bearing, plastic prop, wheels, rubber, and two pages of plans.

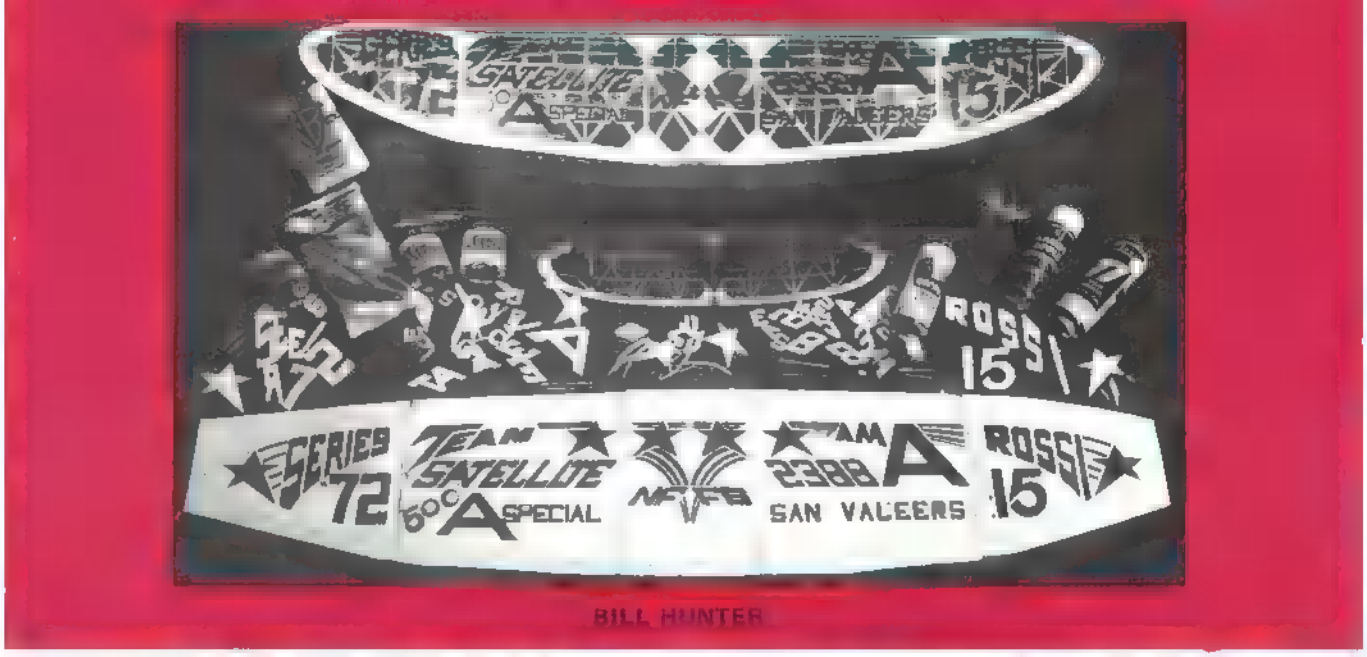
The 1972 MACS is history. Our hat is off to all who had a hand in making it the best ever.

Our hat is also off especially to Russ Merrill, who ably assisted the Ace crew during the entire time of the show. We're proud to be associated with a guy like Russ. If you want answers to your modelling and R/C questions, make it a point to visit Hillcrest Hobbies at 3921 Fifth Avenue in San Diego, California, 92103. Russ knows his way around and he has proven that he can help modellers get airborne.

The next trade show coming up is the one in Oklahoma. This is sponsored by The Oklahoma Science and Arts Foundation, and the dates are October 28 and 29. We'll be there. See you?

ACE R/C INC.

Yours sincerely,
Paul
Paul F. Runge



Mylar

Ultralight and highly colorful sheet plastic is great for FF ships. Here's how to work with it and where to get it.

What is mylar? Glad you asked! Mylar is the best thing since the phone call from that farmer in Fresno saying: "I found your model and the cows only ate one wing tip."

Mylar is a clear, paintable, space age polyester film, manufactured by DuPont. Several different grades are produced, all of which will heat shrink at various temperatures according to the use designated. We have chosen ■ grade in the 275° heat shrink range, so that after heat shrinking with ■ "Sealector" iron, it is least affected by weather and temperature changes. After shrinking, it will withstand direct heat to 150° with no change. Thickness of the mylar governs weight, so we've stayed within one quarter thousandth to one thousandth (¼ mil, ½ mil, and 1 mil) using the thickness determined by our ■■■ research for the particular type model we wish to cover.

How light is it? How strong? Is it fuelproof? Easy to use? Can my models look as good or better using mylar, than they do already? All of these questions have been asked and I'll try to provide the answers.

Weight of ¼ mil mylar is .8 gram per sq. ft. (clear); ½ mil is 1.6 grams per sq. ft. (clear); ■ mil is 3.2 grams per sq. ft. (clear). As ■ comparison of weight: Jap tissue *less* dope weighs 1.5 grams per sq. ft. (28.35 grams = one ounce.) The tensile strength of ¼ mil is 6250 lb./sq. in.; ½ mil is 12,500 lb./sq. in.; 1 mil is 25,000 lb./sq. in. Such strength results in extremely high puncture resistance with great resilience.

Mylar is definitely fuelproof. Clear mylar may be left to set in pure nitro methane. When cleaned off and dried, it can be used as described with no effect showing.

The ease in using mylar is demonstrated by the fact that a 'C' Special Satellite 100 sq. in. wing, prepared as later described, can ■■ ready to fly with- ■ ■■■ hour from covering, start to finish.

The reflective brilliance of a mylar-covered surface is most easily compared to that of glass. Since all paint work is done on the side that will be placed against the surface to be covered, even the smallest ½ model looks like it has fifty coats of hand-rubbed dope, yet weighs less than a doped model of the same structure. An added advantage to mylar is the very low surface drag which becomes important ■■ the model's speed increases under power.

We combine the use of mylar-covered flying surfaces with a fabulous new epoxy paint process, developed by K&B Manufacturing Co., called Super Poxy which we use on all balsa fuselage and fin surfaces. The Super Poxy process virtually eliminates the dust-epoxy problem, since it sets up dust-free in twelve minutes at 70° and ■ fuelproof flyable ■■ twenty-four hours.

Light weight again is the name of the game since using Super Poxy involves only: sanding balsa smooth; coating with K&B resin/catalyst combination; covering with K&B's *new* one and two-tenths thousandth superlight fiberglass cloth (¼ the thickness of a human hair) and blotting the excess resin up with tissue. The resin/catalyst sets up in from five minutes to an hour depending on amount of catalyst used and does not get brittle or become waxy. When set, spray on coat of K&B primer with primer catalyst and K&B thinner. After primer is dry, sand lightly with 220 grit 3M tri-cut silicone paper and spray one coat of your favorite K&B Super Poxy color. (Mixing color charts are available at your hobby shop.) No further sanding or rubbing is necessary and the reflective brilliance rating is 98% that of glass.

Trim colors with Super Poxy may be sprayed after 24 hours. We use vinyl plastic tape—it is extremely thin, bends perfectly around curves and corners and leaves ■ super-thin paint edge which requires no sealing for bleed under.

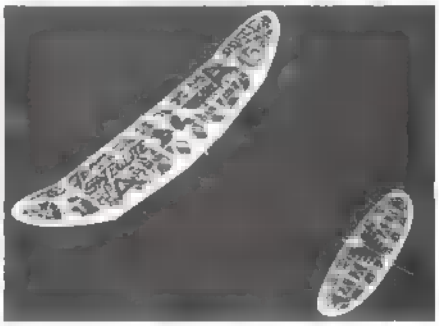
Note of caution: K&B's research and development of the Super Poxy process has been extensive, with best results for the modeler's use as the prime target. They have succeeded ■■ don't try to substitute other products into the process.

As ■ finished example of the total mylar Super Poxy process, see the photo of the Satellite "500" A-Special. The engine, pan mount, timer and accessories weigh 11 oz. and the model weighs nine oz. with ½ mil mylar covering.

We have found mylar to be an ideal covering material for all sizes and classes of models, from indoor penny planes covered with ¼ mil (don't shrink it), through U-Control Combat to the largest 1300 sq. in. Satellite class C-D jobs at 1 mil.

Now we can build strength into structure as never before, so tissue, silk and dope are things of the past. Semi-geodetic construction is used on all

The finished plane shows its geodetic structures. Mylar adds little strength, so its lightness can be off set by beefier structure design.



Series 70 Satellite classes, and flutter-free surfaces result utilizing mylar to its best advantage. Our 300 sq. in. ½As come out at six oz. ready to fly and the 1000 'C' Specials barely make 34 oz. The records set and held by the Series 70 Satellites, covered with mylar, are extensive, i.e., *all* of the 1971 Category I A, B and C Free Flight Junior records, the 1971 Category I Open C record at 73:24, 1972 Category I Open C record at 34:54, 1972 Category I Open B at 24:04, and the latest Category II Open C record at 26:41. In addition, the Satellite 1300 holds the Western States special Class D record at 25:00.

I realize that mylar is an entirely new medium for most modelers, and for those who have developed their skill with tissue, silkspan, silk, and dope, the change could be mind-bending. I've been a member of the glue-chewing fraternity for over seventeen years and changes in method don't come easily to me either, but "try it, you'll like it!"

The procedure for painting and covering flying surfaces is as follows: Color must be added to the clear mylar unless you want to drive the timer crazy! To paint the mylar on a clean workbench, lay out a rectangular section, twice the chord plus a couple of inches for overlap (all around) of the surface you intend to cover. Tape the section to the bench *where necessary* to stretch out any wrinkles or creases. To do a solid translucent color with no lettering or design, shake a spray can of your favorite color of "Kandy Apple" brand lacquer, and lightly spray the mylar. Let it set about three minutes and spray again. You'll start to see the color you desire by now. Don't try to make it too deep, as it is translucent. When you are satisfied with the color, let it set to dry. I usually check the very edge with my finger tips.

An adhesive is applied to the framework of the wing or stab. We use 3M "77" clear spray contact cement. We've found 3M 77 to be the best available, after experimenting with many different types. The container holds 23.5 fluid ounces and it's enough to spray contact several huge "C-D" free flights. Dry weight is 1/10 fluid weight.

Hold the framework to be spray contacted up away from any other material and *lightly* spray the entire framework particularly the outline, and bottom. As an example of how much spray contact should be applied, passing the spray over one entire side of a Class "C" stabilizer should take no more than six seconds. Then hang it up to dry for a few minutes. Even when the spray has dried for ten minutes or so, it will still feel a bit tacky, especially if you've sprayed your fingers!

We always cover the bottom of any surface first, so let's suppose you have spray contacted a flat bottom wing, such as the Satellite. The mylar you have painted is still taped to the bench. Set the wing right down on the painted mylar, locating it so that you'll have enough to cover full length in one piece, and also so that plenty is left chordwise to cover the top, with overlap. Look down on the wing outline and with a sharp blade cut the mylar all around the edge outline. Leave some overlap to allow for error. When the mylar has been cut all around, tip the wing spanwise, first to one side and then the other, to pick up the mylar with the slight tackiness remaining from the contact spray. Turn the wing over and set the center section on something so it will stay where you put it.

Now something very important becomes apparent. All the paint is on the inside! Completely fuelproof! If the mylar has moved or slipped readjust it and a bit of finger pressure will hold it in place due to the slight tackiness of the contact.

At this point we plug in the Sealector sealing iron, and set it at 50% of maximum heat for ¼ mil, 45% for ½ mil, or 40% for ¼ mil. When hot, touch the center of the bottom center rib on the mylar with the tip of the iron. With just the touch, it seals immediately at that point. Now touch the iron at the leading and trailing edge (center rib) the same way. Do the same at the dihedral breaks and at the center of the tips. Since the wing has polydihedral, we slice the overlap with a blade out away from the dihedral joints at the leading and trailing edge.

This is a good time to do away with a lot of the overlap, so turn the wing back over on the bench. Place a straightedge on the mylar up to within 1/16" of the straight portions of the LE and TE and cut. You'll have to do the curved tip sections freehand, but just use the edge for a guide with your thumb resting on it.

Flip the wing over again; now you can hold it in your hand rather than on the bench if it's comfortable. With the

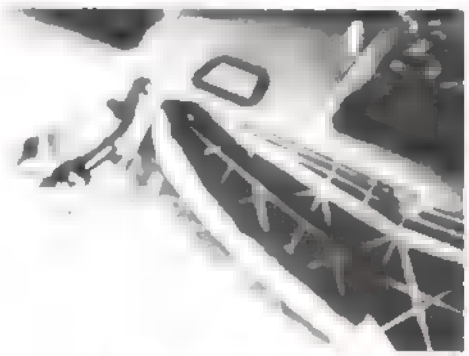
Only one word describe this model—beautiful.

S.T. 65 drives this Class C-D ship skyward at extreme velocities, yet ¼ mil mylar over Jap tissue worked fine and even survived DT landings in Volkswagen size rocks.

Above: Thin cutout is paper used to mask the wing ribs for spraying adhesive.

Right: With heat iron, attach mylar to dihedral break ribs and around edges of structure—just like MonoKote.

Below: Pull and stretch while heating. Compound curves are a cinch.



Complete wing and stencil layout of stab covering with spraying of K&B engine in progress.

sealing iron at right angles to the edge to be sealed, touch the iron gently to the mylar with a downward wiping action all around the outline. Do not shrink the mylar on the bottom at this time!

For the top of the wing, it's best to cover the tips first and, since the mylar must overlap when cut into tip, outboard panels, and center panel sections, be sure you start your first tip cut far enough to one side of the mylar on the bench to allow for the overlaps. To do ■ tip, prop the wing up, so the tip lays flat on the mylar. Mark or cut the mylar about 3/8" inboard from the tip dihedral break. Cut around outline of the wingtip leaving at least ½" overlap all around, to allow for curvature (camber) and sealing under later. Remove the mylar tip portion from the bench and place it on the opposite tip, paint side down, overlapping the dihedral rib. Carefully razor cut slits in the overlapping portion at the tip dihedral rib, away from the rib, toward the center of the wing. This is done to allow the mylar to fit the curve of the rib well, and to allow the overlap to be sealed down the vertical side of the rib. Some contact cement was sprayed on the side of the dihedral rib when the top and bottom of the framework was done, but it's ■ good idea, at this time, to take the tip piece off. Lay it paint side up and, using a piece of paper as a shield (outline of tip), spray the tip overlap and the outline overlap light with contact.

Replace the tip mylar when contact is dry. Fit so that the razor slits line up on the dihedral rib, and press down the slit portions along the side of the rib with a finger. Slit the outline, away from the leading and trailing edge, at the dihedral break rib. Touch the sealing iron to the top of the dihedral rib in the center and at the LE and TE. Also touch at the very tip edge and, with ■ wiping down motion, several spots around outline. Using the same motion, now complete the seal. Using the tip of the iron, heat seal and slit overlap sections you pressed down on inboard side of dihedral rib. The maximum amount of overlap needed is about ¼", so if you have an excess around outline, trim with a sharp blade or scissors. Slit these, in the center of each wrinkle, on the overlapping portion only and seal under with the Sealector iron.

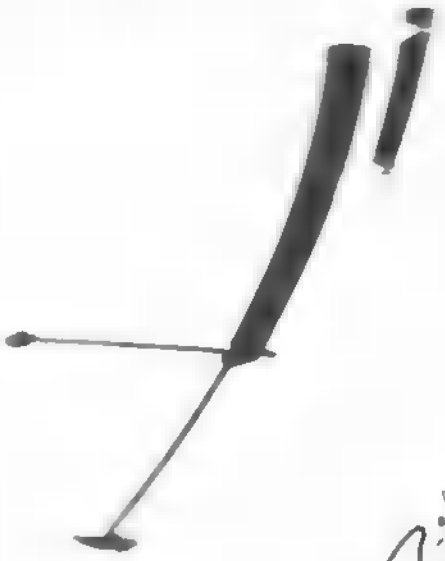
Now that the tip is covered and sealed, you may want to find out how it shrinks up. First, take ■ straight pin and puncture a small hole in each sealed bay to allow air to breath in or out when shrinking. Starting at the tip on the bottom, just touching the surface, pass the iron over the first section. Go to the top of the wing, and starting at the very tip, touch the iron to the surface and pass it back and forth from LE to TE slowly, and as you move in toward the tip rib you'll see those wrinkles disappear. Satisfied? Don't go any further! Do the other tip! Everyone who has ever covered a polydihedral wing, straight or elliptical, has had the problem of tissue, silkspan or silk pulling up across the dihedral angle; mylar is not different.

With a bit of extra balsa, you can

(Continued on page 91)

WITH A TWIST OF YOUR WRIST, THIS SINGLE-BLADED, .010 POWERED THING SWISHES ALOFT. GREAT FUN AND EASY TO MAKE.

H.D.M. SHERRERD, JR.



Charybdis

In Greek mythology, Charybdis was an extremely powerful whirlpool off the Sicilian coast. This helicopter is not particularly powerful, but like its namesake, everything revolves at a rather high rate of speed, and to that degree at least the name was appropriately chosen by the inventor, Charles W. McCutchen of Princeton, New Jersey.

Charybdis was developed 18 years ago, while McCutchen was living in Cambridge, England, and caused something of a sensation when he took it to the British Nationals of 1954. Since that time, variations on the "McCutchen Machine," as the design is more generally called, have occasionally appeared in European magazines, but a prophet is usually without honor in his own country, and the Charybdis seems to have been completely ignored in the U.S.—a pity, since it is no tougher to build than a good hand-launched glider, and more fun than tying firecrackers to your old flying scales.

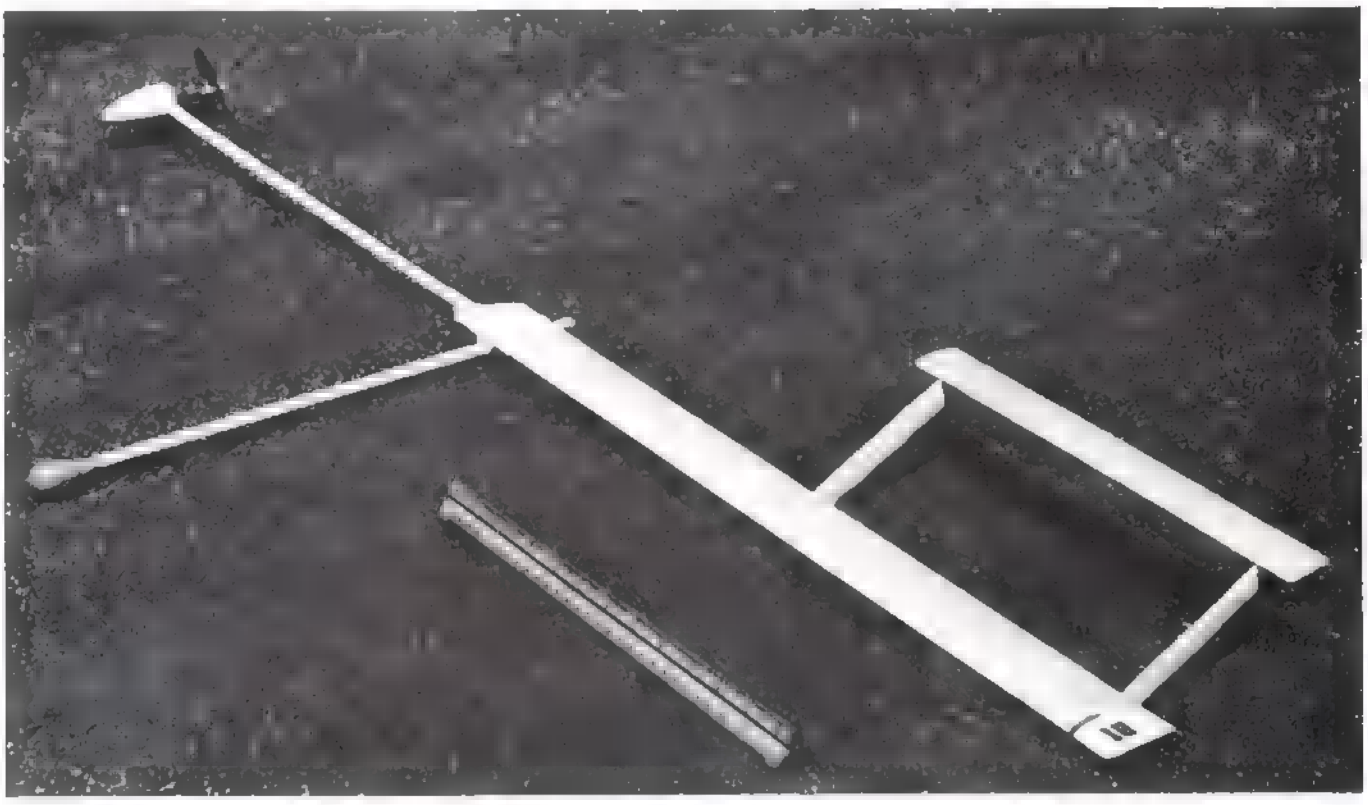
Construction

Construction is quite simple, with the emphasis on strength. The blade and stabilizer are of sheet rather than built-up, the motor and balance arms are of spruce, and the hub is reinforced with 1/16th plywood. The motor arm is inlaid into the lower surface of the blade, the reinforcing plate double-glued over the joint, and the whole bound with silk or other light cloth. This area is then virtually unbreakable, and also a good flat surface for the balance arm to bear against. You can, of course, glue or even bolt the balance arm in place, but Charybdis is much easier to carry around if the arm is detachable.

The blade is simply a 2' x 2" lath of ¼-in. medium sheet balsa, shaped to a constant Clark Y section. No wash-in, no wash-out, no dihedral breaks; the squarest, easiest wing you ever made. Use a template to maintain section accuracy. Don't try something with undercamber instead. McCutchen tried both undercambered and curved-sheet airfoils, and found the resulting Charybdis to be unimproved, at best, or just plain unstable, at worst.

The stabilizer struts are 1/8th hard sheet sanded to a streamline section. Use plenty of glue and perhaps even some silk reinforcing at the strut-to-stabilizer joint, the only vulnerable [redacted] of Charybdis. The stabilizer itself is also 1/8th hard sheet, but is given a lifting section. Be careful to set it at an angle of at least -5° or -6° relative to the blade, as this is most important.

The motor pod is so designed mainly because it looks good. The streamlining probably helps a bit, but is really unnecessary. On the other hand, it does provide a solid mass behind the firewall



(if you can call it that) and a little more weight. (The Cox 010 is awfully light.) The 1/8-in. plywood firewall is inlaid into the motor arm, and the pod itself built up from the same ¼-in. stock used for the blade, or anything else in the scrap box, then carved and sanded to shape. With the motor inverted, as shown in the photos, the mounting screws bear through into the spruce arm instead of the soft balsa. Add a wire guard loop if you think it necessary, but the prop generally seems to be enough protection for the glow plug even when landing on bare spots.

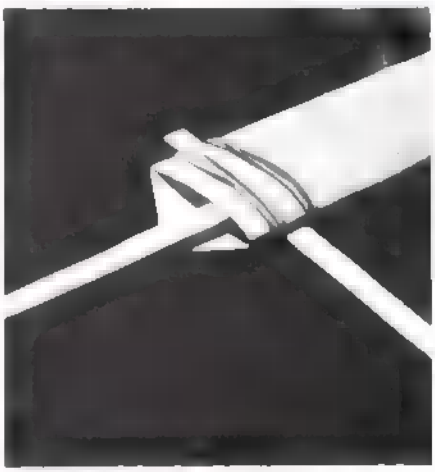
Thinned, clear, hot, fuelproof dope is used on everything except the motor pod and adjacent portion of the motor arm, where straight dope is used for extra protection. Colored dope could be used, of course, and should produce a pretty jazzy effect with Charybdis revolving at the speed it does.

The inverted position of the Cox 010 has been found the best after much painful trial and error. The tank outlet is slightly high, but the fuel line itself is at the extreme outside of the swept circle, and fuel does not have to fight centrifugal force on its way to the needle valve. The other arrangements that seem so obvious either don't work for one reason or another, or offer no particular advantage.

Because of variations in engines, fuels, weather, altitude, etc., finding the proper needle valve setting is something you must do yourself; there is nothing else for it. But there is one peculiarity of the system worth mentioning that makes all the difference in running time: an odd combination of forces and pressures is at work that requires block-

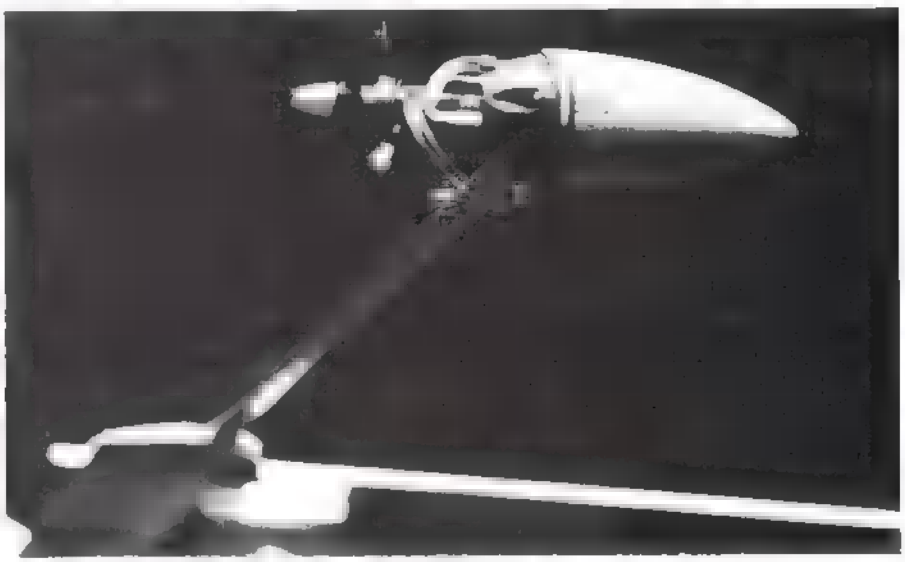
(Continued on page 68)

Above: This has got to be the easiest helicopter type thing yet—only [redacted] rotor blade!



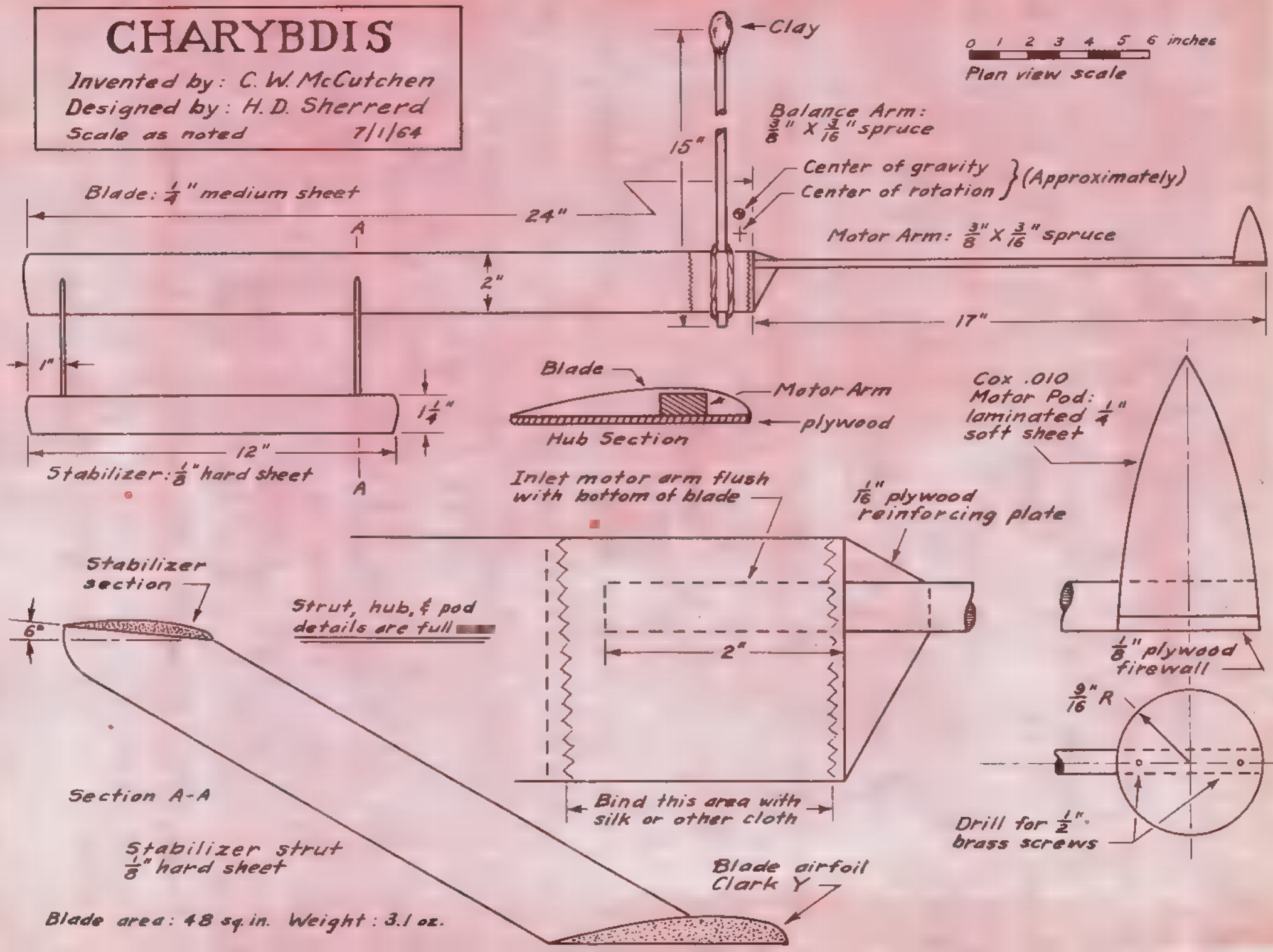
Right: Rubber band mounted weight boom affords easy adjustment of CG [redacted] crash protection.

Below: Inverted Cox .010 works much better than if it were upright, but [redacted] one knows why. Don't fly over concrete.



CHARYBDIS

Invented by: C. W. McCutchen
Designed by: H. D. Sherrerd
Scale as noted 7/1/64



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3 Fluid Ounces	$ .49
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A completely new formula that sprays a dense, fine mist. Supercoat Spray Dope covers well and adheres to the surface with less tendency to run or sag. Long shelf life. ANOTHER FINE SIG PRODUCT!

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Superior Results ***Reasonable Cost***

CLEAR		COLOR		THINNER	
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Pint	1.69	Pint	1.79	Pint	1.19
Quart	2.79	Quart	2.98	Quart	1.98
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1/8 x 12 x 24	$1.60
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AIRCRAFT PLYWOOD IS TOO HEAVY. IDEAL FO
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16 Oz.

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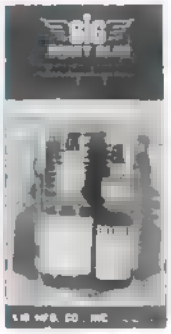

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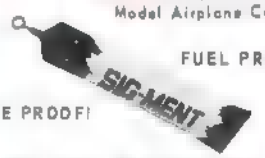

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BILL BOSS
SPORT AND SCALE

Old-Timers: When we talk of Old-Timer activities in aeromodeling, most modelers immediately think of the free flight category because of the emphasis, support and publicity given by the free flighters. However, in recent years there has been an attempt to bring Old-Timer activity into control line. This has been evident over the past two ▬ three years with increasing numbers of clubs running Old-Time Stunt events where entries are restricted to ships such as the T-Bird, Smoothie, Chief, and Noblers, using the old AMA Stunt rules.

A recent letter from Quinn Finta suggests that perhaps the Old-Timer theme could also be related to Scale. Quinn makes his point by illustrating his recently completed B-26 from an old Cleveland kit. You can hardly get more old-timer than that. The plane's construction is beefed up in the nacelle and landing gear areas to withstand engine vibration and the rigors of CL flying. All other construction was completed as shown in the kit.

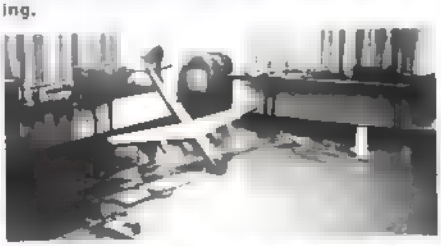
Unique B-26 by Quinn Finta ▬▬ from a 1944 Cleveland SF-Master Kit uses 15s for power. Excellent cockpit detail and complete aluminum skinning with all rivet detail.

Why not more of this type of construction? While kits are not available from Cleveland, there are many plans for old-timers. Why not an event where only old-timers such ▬ the B-26 that Quinn has shown ▬ are entered? The event doesn't necessarily have to be a flying event; the new AMA Static Scale rules would be ■ natural for judging such planes. Scale-only planes would also ▬ ideal for PR purposes at local meets and shopping center displays. Why do we Scale bugs always have to beat our brains out getting a Scale monster to fly? Why not enjoy a contest where everyone sits around and talks about all the great detail put into the ship. Choose the winner for the best workmanship and fidelity to Scale. Think about ■ fellas—this kind of activity might just be fun.

Cutting Holes in Cowls: Among the many questions asked by the new Scale builder there is one that seems to ▬ a favorite: "How do you cut ■ hole in ■ metal cowl without collapsing or distorting it?" Most modelers drill a series of holes around a circle to ▬ cut out and ▬ distort the cowling. To help eliminate this problem, make a wooden plug of balsa (hard wood ■ better) for insertion into the cowl. With the plug in place, the engine head hole is marked off and the series of holes is drilled as usual. Keep the holes as close as possible. You will find the wooden plug supports the cowling during drilling and prevents buckling. After the holes are drilled, snip away the material between the holes with a small pair of diagonal cutters. Carefully remove the plug and shape out the hole with ■ small fine file.

Another method involving less work is to cut out the hole with ■ circular saw like those used by carpenters for cutting in door locks. The saws, made to be used with ■ 1/4" electric drill, come in clusters of four or five saws which make holes to fit most engine heads. They are available at most hardware stores, and should have the finest teeth possible.

When using the saw, start ▬ with the wooden plug in the cowl. Mark off the center of the desired hole and, using the proper size saw, cut out the hole. Be sure to feed the saw very slowly. Minor touch up with a fine file may be required. If you are attempting to cut out a hole in ■ cowl for the first time, it might be wise to practice the procedure on several aluminum cans to get the ▬ of how this thin cowling material cuts and files. It's better to ruin the cans than the hard-to-replace cowling.



The loot offered for auction at recent Key City Prop Twister's Club meeting. B-29 anyone?

Ed Thomas stirs interest to bid ▬ ■ slightly used P-40 without wheels.

Club Auction: Looking for ■ way to dispose of some old equipment to raise money for the club ▬ ▬ of AMA's team funds? A club auction may be the answer. Jerry Farr of the Key City Prop Twisters in Abilene, Texas, reports that ▬ ▬ items were sold at their most recent auction with 25 percent of the proceeds going to the club treasury for club-sponsored activities. Sounds like ■ good idea ▬ an adjunct to a regular club meeting and ■ means of disposing the old modeling gear you no longer use.

Clunk Tank Improvement: To ▬ the fuel tubing in your clunk tank from folding over and restricting ▬ fuel flow, replace some of the flexible tubing inside the tank with cop-▬ tubing. Use flexible tubing only to connect the copper tubing to the outlet tube and to the clunk.

JOHN SMITH
SPEED AND RACING

Soap Box Gleanings: An interesting letter from Dick Halley in Tulsa, Oklahoma says he would like to see limits put on some events as far as equipment, modifications, and cost are concerned. He points out that Rat (here we ▬ again) has gotten out of hand for the beginner flier with custom engines, super fuels, hand-built equipment and the like. ▬ thinks there is too much white knuckle, teeth grinding and grimaces, at supposedly fun type sport events (Rat Racing). He also believes stock engines, low nitro fuel and ■ ceiling price on engines should be used, and a minimum dry weight should be established. This is being done with the new ½A TR being run in many places. In Cleveland where the event is called Formula V, the turnout for the two contests run so far this year has been great. Many Juniors and ■ surprising number of older fliers have shown interest in the event. Some pit stops have been like Laugh-In, but the fun is there. One manufacturer is even coming out with kits for these mouse racers. More on these when I have the chance to build one of the kits. Many events that were originally started as fun or beginners events have evolved into expert events that ▬ the same faces in the winners' circle.

Proto Speed ■ a good example where rules have been bent, stretched and otherwise abused until their intent has long been lost by the wayside. When started in 1955 it was primarily an extention of Team Racing type equipment in a one mile sprint race. Airplanes, according to the rules, looked like airplanes. I can remember one model which was disqualified at the '57 NATS because it had a swept wing and the event director decreed it didn't meet the look-like-a-real-plane part of the rules. The resulting furor included ■ sit-down strike by the contestants, the resignation of the event director, and many impromptu meetings to straighten things out. After all the hassle, the airplane was allowed to compete. Today 65 to 75 percent of the proto ships flown wouldn't pass the processing of those days. What is the answer? Let's hear from you.

Jim Wade's photos of Ron Ivaldi, Mike Hoyt and Hazel Hoyt seen ■ recent all-speed meet with their Dyna-Jets. Hazel flew hers at the Nats Air Show this year, too.

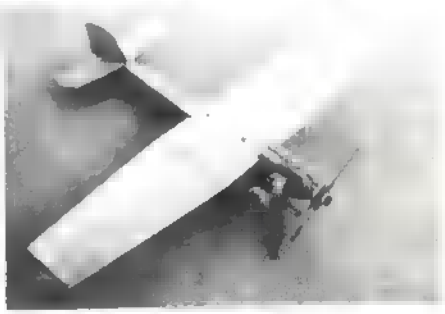
How to Write ■ Letter Department: When letters are received, many interesting points can be used in this column, but remember there are many differing opinions. I have received ■ number of letters taking me or others to task for ideas and suggestions expressed in this column. I read them all, but some guys really get carried away with threats, bad language, etc. Keep the comments clean, and I'll pass them on; otherwise it's File 13. Let's give everyone a chance to be heard from.

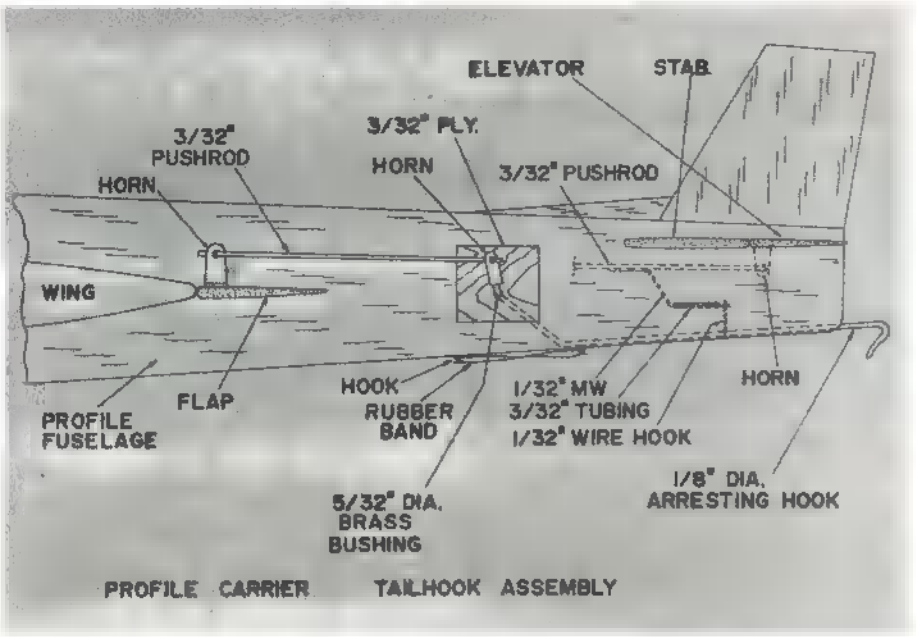
JOHN BLUM
CARRIER AND STUNT

Which Way Strength: Let's face it! It's critical! Where do we stop, securely? Wires, line clips, external construction joints, we can see. What about the internal joints? At a recent local activity, a Class II Carrier model disintegrated from the wing forward at about the fourth lap. Fortunately no damage was done to anything but the airplane.

Now, how do we inspect the aircraft internally? For the most part, we don't. Carrier models experience rough treatment far beyond what most of us are capable of grasping. Each time the model comes to an abrupt arrested landing, every joint is stressed. I don't have the total answer, but there are safety measures. How about a flexible safety cable bolted to the engine backplate or mounting bolt with the other end bolted to the bellcrank mounting bolt? Then you'd ▬ holding onto your engine, in a manner of speaking.

This ▬ is strong—a Martin MO-1 with .010 sheet aluminum wing. S.T. 65 drives it and Bill Johnson-type throttle system controls it.

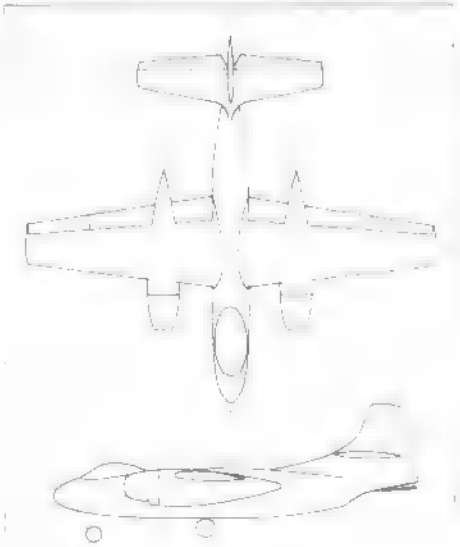




Profile Hook Assembly: Sketch shows a typical setup for a profile carrier model landing flap and hook arrangement. Hook release is accomplished by "snapping" extreme down-control.

Flap installation is typical, except the horn is on the inboard side. Elevator and control pushrod assembly is typical. Plywood doublers, 3/32", are added by setting into the fuselage sides at location which centers with the tailhook pivot. After the hook is installed, a shim-stock horn is soldered to the end as shown and connected to the flap linkage.

The arresting hook release consists of a piece of brass or aluminum tubing epoxied to the side of the fuselage through which a 1/32" m.w. release rod passes. One end of the release rod is soldered to the elevator pushrod and the other end protrudes through the tubing. A hook of 1/32" m.w. to solder to the arresting hook is made with loop in the upper end through which the release rod passes. The down activating force is then created by a rubber band connected by small hooks to the fuselage and the arrester hook. The arrester hook is bushed with a piece of brass tubing at the pivot. A simple, quick method, but adequate.



Month's Two View: Drawing shows outline of North American AJ-1 Savage. An interesting subject for Carrier model. It is presented here for comparison of moments and span-area relationships with other Carrier plane drawings which have appeared in this column.

Unfortunately, the model is uncompetitive since the class in which it must compete is determined by totaling the engine displacements. Thus, with two .19s, competition would be in Class I, anything larger would fall into Class II. The maximum is .65 cu. in. total.

FW 190 by M.R. Guthomran flies well with O.S. 50 power turning 13-5 prop. Model weighs only 51 oz.

Stunt Model Landings: Some novice stunt fliers consider landing one of the simplest maneuvers. However, it is difficult to do (it total 40 points), and takes practice to perfect. How many have made near perfect landing only to have the model roll into the wind and lift off again? The lift-off may be only momentary, but it is disastrous to your score. There are some approaches to remedy this situation. One is to build and fly models with tricycle landing gear. The presence of the nose wheel permits the application of extreme down control just after the model touches down. Another approach is the long tail-wheel landing gear to place the model at zero or near zero angle of attack after touchdown. It's not the final answer to the perfect landing, but it helps.

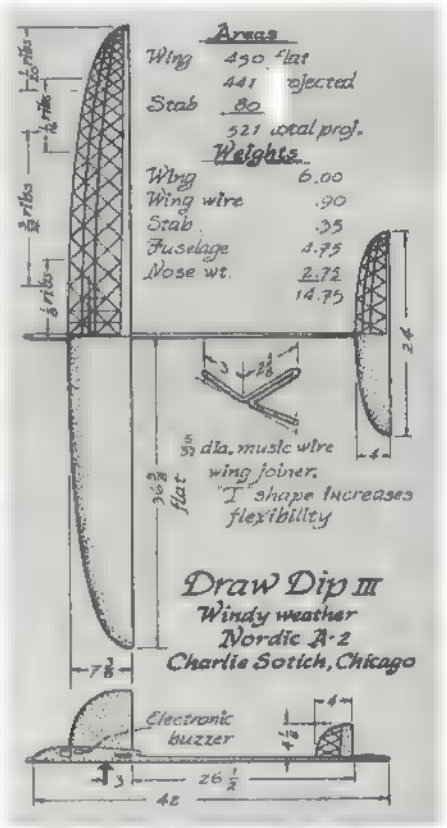
Column News: This part of the CL coverage can only be what you fellows make it. Send items to John Blum, 2417 Glen Pl., Granite City, Ill. 62040.

Free Flight

BOB MEUSER
SPORT

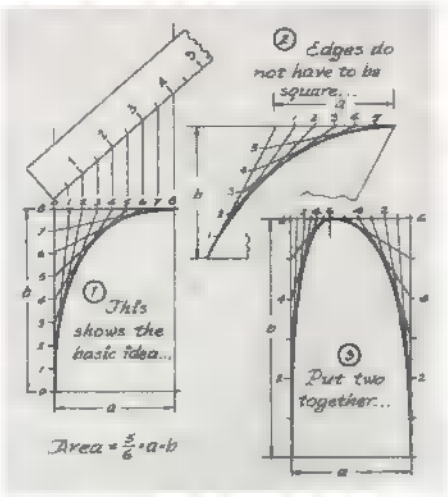
Windy-Weather Nordic: Chicago Aeronut Charlie Sotich's Draw Dip Nordic is featured not merely because it is fine performer, but also because it is virtually flying display of unusual features—features which might be applied to other Nordic designs and to models for other classes as well. There too many features to present at one sitting, so we'll hold some for next month.

Dick Lyons launches fellow Chicago Aeronut Charlie Sotich's windy-w ther Nordic.



Note the wing-joiner wire on the three-view. A single wire 5/32" dia. is used in place of the usual two or three wires of smaller diameter. The peculiar T-shape results in great flexibility, as the fore-and-aft legs act as torsion bars. The wings can deflect to a tremendous dihedral angle when the model is towed without fear of the wires taking permanent set. The flexing of the wire occurs outside the wing, rather than within the wing tubes as it does with the conventional straight joiners, which takes some of the strain off the joints. With a single-wire joiner, the wing panels can be shimmed independently to provide easy adjustment of the wash-in of the panel on the inside of the turn. We don't know whether Charlie takes advantage of that feature, but Toronto's Tam Thompson uses single-wire joiner for that purpose. The joiner is not built into the fuselage; instead, the wing is strapped to the fuselage with rubber bands after the wing panels are slipped over the joiner. Everything has its drawbacks. Bending 5/32" music wire is, let's say, character building.

When tiny electronic buzzers first hit the market, I was one of the first kids on the block to send in my box-tops for one. However, it produced such pathetic little peep I abandoned it. My mistake was not trying it outdoors in model. Fliers like Charlie report them to be a big help in finding a model buried knee deep in weeds. The buzzer weighs only eight grams, is driven by two tiny N-cells, and can be obtained for $4.50 from Projects Unlimited, 1926 East Siebenthaler



Ave., Dayton, Ohio 45414. Specify model GA 100. The buzzer turns on when the model dethermalizes.

The wing and tail outlines are laid out according to what has been called the "parabolic development" shown in the sketch, similar to the surfaces on many of Charlie's designs. You could just draw around a handy French curve, or the sole of your shoe, but consider what the parabolic development has going for it: it is easy to plot, and is reproducible. That makes scaling a model to a larger or smaller size a cinch. It is easy to figure the wing area by just taking 5/6 of the area of the enclosing rectangle or parallelogram. That beats counting squares or weighing sheets of cardboard cut to the wing outline. Compared to the ellipse, it has a wider chord near the tips—narrow chord equals low Reynolds number equals bad omens. And lastly, it pleases the eye.

The fuselage is just a gob of balsa plopped atop the fiberglass boom. The lead ballast weight slides into the front of the boom, is positioned to give the proper balance point, and is pinned in place. I wonder whether Charlie shaped the front end to look like a dolphin or porpoise? (Ugh!)

The wing construction looks monstrously complicated—37 ribs, count 'em, and all different. But actually, there are *no* ribs to cut, in the ordinary sense, which should be bad news to shareholders of Band-Aid stock. The ribs are simply plain strips; the airfoil is sanded in after the assembly with a specially shaped sanding block. We'll save the construction details for next month. At this point a few words about the airfoil section are in order.

The top-surface profile is a ten percent Annenberg Simplex airfoil. The Simplex airfoils, often used on indoor models, appeared in the 1960 *Air Trails Model Annual*, and subsequently in the *Internationalist*, Nos. 11 and 12. Mathematically it is a logarithmic or equiangle spiral, and it has a unique property: any piece of the curve starting with the leading-edge point is a scale model of any other piece of the curve which includes the leading-edge point. In other words, you can use the same template to cut an airfoil of any chord and, percentage-wise, they will all be right on. The bottom surface is simply a circular arc. Since the radius of the arc is constant, the undercamber decreases, percentage-wise, from the root to the tip. But, because the planform is rather full toward the tips, the undercamber change is only about one percent from the root to within ten in. of the tip. For the geodetic structure, a shaped sanding block takes the place of a rib template.

Stay tuned to this column for further developments in the saga of Life with Draw Dip.

WALT MOONEY
SCALE

Contest Season: The scale contest season seems to be underway, at least in Southern California. Bob Peck, the producer of a new line of scale models called Peck's Polymers, sponsored a contest for models built from his Miles M .18 kit. About a dozen contestants showed up for some competitive flying. Walt Mooney, who didn't compete, was drafted to

Your author wants to show us that his whole family gets into the model act, here Chrisiea Bee Mooney with her "Phalz-Fokker."

judge entries for Scale. It wasn't easy, but the end result had Bill Hannan top in Scale and Bob Bradley top in flying for the Open Class.

The Orbiteers held their monthly Scale contest and it looked like the Peanuts were taking over. There weren't many Gas entries, so for fun Walt Mooney entered his Phalz-Fokker as a Fokker E-I. This model, designed as a beginners' Sport Gas model, has a tail thin pilot in lieu of dihedral. The E-I is sure to get maximum dihedral points. Some minor complaints were made about the pilot but the fun-loving Orbiteers let it go—nowhere do the rules mention scale pilot requirements. The model proceeded to get top flight points for the day.

The author doesn't really advocate the entry of semi-scale models in Scale contests, but he is a real advocate of fun in modeling.

The *piece de resistance* of Scale contests was the annual Scale Seaplane contest put on by the Flightmasters at Lake Elsinore. They must have a special pact with the gods of the thermals because though the previous week the weather was poor, it was calm, warm and sunny on the contest day.

The quality of flying has improved significantly from the average of previous contests and most everyone managed to take off once. But the quest for light weight has resulted in less-than-waterproof dope jobs on the smaller models. They have gone and more difficulty taking off, and graphically illustrate by their flying that they get increasingly tail heavy.

Granger Williams entered a very nice RC Deperdussin Schnieder cup racer and demonstrated that radio can sometimes save a tail heavy model if it is skillfully piloted. He also flew a three-engined Blom und Voss seaplane for the Las Vegas contingent, but it would only fly with full up elevator which made it difficult to turn while maintaining altitude. One impressive performer was an RC Shoestring on floats. It was rather spectacular, but how does the scale judging go?

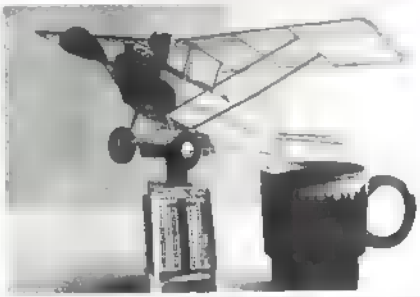
There were several CO-2 entries—that seems to be the ideal power for a small scale seaplane. If the model dunks the motor stops, but the compressed gas keeps out the water for easy restarting. Gas engines can mean to start after a dunking, and rubber-powered models keep running which can result in an attempt at being a submarine.

At least six of the Las Vegas contingent enthusiastically took part in the contest.

Seaplane flying really is fun, and the spectators seem to enjoy it as much as the contestants. Maybe it's the tendency to return to our primordial ancestors in the sea.

Peck Polymer's second kit is a model of the Ford-engined Pietenpol Aircamper. Bob Peck's original model has won several of the local Peanut scale events and done over two minutes outdoors several occasions.

Bamboo Splitting: A recent letter asked about the techniques for splitting bamboo in some of the old-timer models. The writer has trouble every time he tries to split off a one-sixteenth inch thickness because, though it starts right, it always tapers off to nothing. The real old-timers know that to get parallel sided pieces each split must be made down the center of the original piece until you finally achieve two pieces of the correct thickness. For instance, a quarter-inch piece can be split into two one-eighth inch widths and each of these can be split into two one sixteenth



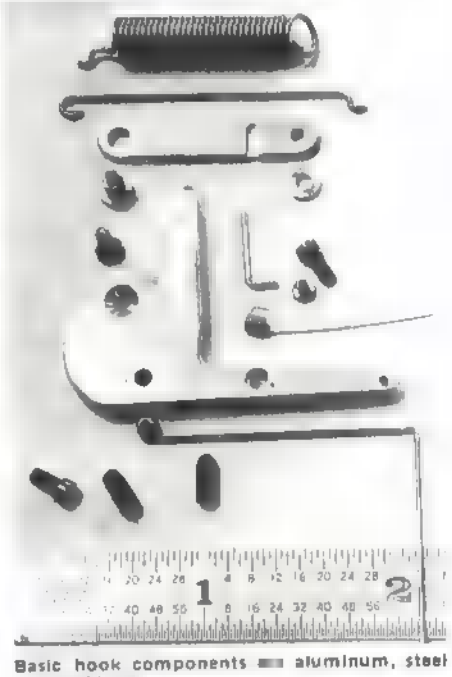
A Pietenpol by Bob Peck doesn't even nudge a postage meter.

inch widths. Trying to cut a single one sixteenth inch piece off the quarter inch piece will almost always taper thinner towards the end of the split.

Even more modern models occasionally use bamboo. It makes strong, resilient rear motor pegs, very thin wingtip bows which are nearer scale than sheet balsa, and can be used wherever a thin yet strong and supple member is required.

HATSCHEK
GADGETS AND EQUIPMENT

The "Littlehook": Back in the 19th Century when this gadgeteer's paternal ancestors migrated from Moravia or Bohemia to the Austro-Hungarian Empire, they changed the spelling of the family name from the Czech Hacek to a more Germanized Hatschek. All of which is quite immaterial except for one thing: The Czech word *hacek* means little hook, and what we call a towhook, Czech glider fliers call a *hacek*. Which brings us to Hatschek's *hacek*.

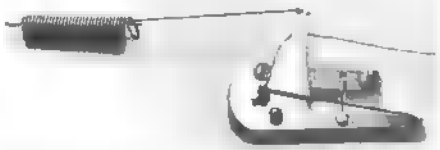


Basic hook components aluminum, steel wire and brass.

This towhook mechanism is a major departure from the swinging style of hooks presented last month. It works as well, providing four distinct rudder positions for straight tow, circle tow, zoom launch, and glide circle. It has proven itself useful on five Nordics during the past year. No claim is made that it works any better than previously described mechanisms. Its major advantage, and the basic reason for its development, is that it can be installed in a glider fuselage consisting of a sheet aluminum pylon epoxied into a slot in a fiberglass rod. It is lighter and more compact than the other mechanisms and also provides a mounting arrangement with sliding adjustment. Though it is not simple to construct (remember, I *like* making gadgets), clever glider fliers can probably figure out ways to build it.

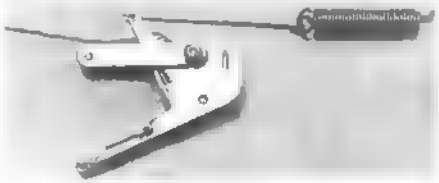
The individual parts of the mechanism are

shown before assembly in their completed state except the .010" wire latchspring (center) and the .031" wire lever (near bottom), both of which are cut off after assembly for convenience. No dimension is especially critical, but the general positioning of all pivot points, stops, latch and adjusting screws was finally determined by a detailed analysis of why ■ previous version didn't function as well ■ it might have.



Articulated towhook in latched position. Towring omitted for clarity.

A hard pull on the towline, 3¾ to 7 lb., unlatches the hook and allows rudder to move toward glide position.



The hook itself ■ made from 3/16" flat aluminum, the pivot mount from 1/16" flat aluminum, all wire parts except the latchspring are .031" diameter, and the two bushings ■ brass (ID of the pivot bushing is tapped 2-56). The upper portion of the hook is milled down to about .080" thickness from the right side. This could be done with a file, but it would be rather tedious. Other machined details on the hook, such as the shallow pocket into which the latch retracts, could be produced with a Dremel tool.

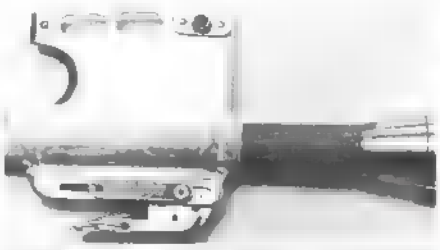
How does the *hacek* function? The second photo shows the hook in latched position. It's rather evident that ■ tow ring ahead of the latch would pull down on the wire lever, pulling on the line that goes back to the rudder horn to center the rudder for straight tow. Easing off on towline tension allows the lever to rise, and lets the rudder swing over into a turn. If a two-position rudder stop is used, the rudder actually swings past the glide turn position for circle tow.

For the zoom release—the hook's most important advantage—the launcher pulls harder, bringing the towhook into the position shown in the third photo. This unlatches the hook and also, because the rudder cable goes through a hole above the hook pivot point, allows the rudder to shift slightly toward the glide turn. Not visible in any of the photos is the fact that there are three holes through the hook upright, providing a coarse selection of zoom rudder travels depending on which hole the autorudder line passes through. Fine adjustment of this function is provided by the front one of the two 4-40 set screws in the bottom of the hook which sets the maximum rotation of the hook. The rear one of these two set screws adjusts the angle of the towhook in its up position.

Tension of the main operating spring is adjusted by an inch-long screw (not shown) that is accessible through the nose of the glider. The only reason for the separate wire link going forward from the top of the hook to the operating spring is to clear the aluminum pylon inside the body. The spring is also inserted through the nose, and you have to fish around a bit to hook it up. A bright light shining through the fiberglass body helps immeasurably. Depending on glider trim, wind velocity and such considerations, the tension at which the latch releases should be set at from 3¾ to 7 lb. (using ■ fishing scale for calibration and always holding the glider body by the rear wing rod).

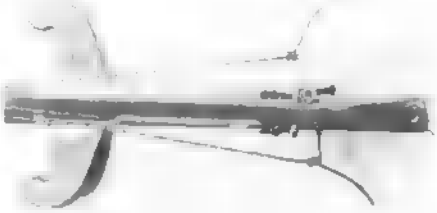
Installation on ■ glider is shown in the fourth photo. The pivot mount goes on one side of the pylon, the hook on the other. The tapped pivot bushing, which is firmly screwed to the hook, is long enough so that it doesn't bind in the pylon slot. The screw at the rear of the pivot mount simply clamps the works in the desired position.

Autorudder detail is shown in the next photo. The line at the bottom of the photo, connected to the rudder horn, is the one that comes from the towhook. The line at the top of the photo is hooked to the horn of ■ two-position rudder stop. The other end of this line is released by a pin attached to the towline which also starts the dethermalizer timer in a fashion similar to normal autorudded actuation. Four 0-80 screws are used for various adjustments.

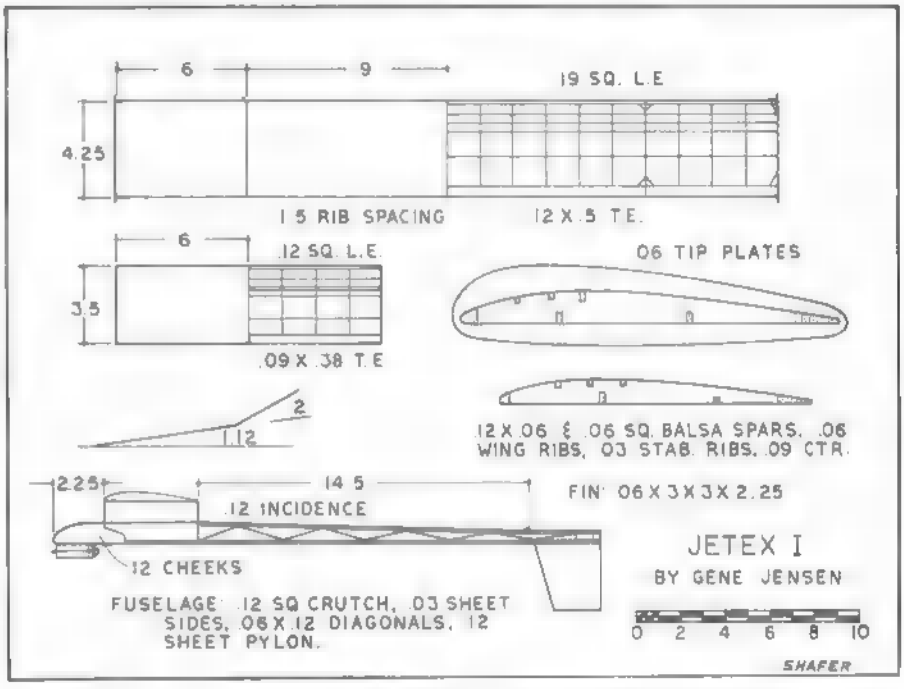


Advantage of this hook design is compactness. Body is 5/8" fiberglass fishing rod, pylon is 3/32" aluminum alloy.

Two-position autostop works in conjunction with unusual towhook to give four rudder positions.



Author winds up dethermalizer timer on windy-weather glider, while 1972 NATS Free Flight Champ Frank Wolff stands by to launch.



BOB STALICK

GLIDER, RUBBER AND POWER

Silver Anniversary—Thank you, Navy: When you read this, the 25-year-old tradition of USN-AMA-operated Nationals will be history. The times they are ■ changin', but the relationship has always been a friendly cooperative one. Too bad it has to end, but it is fitting that it lasted this long and that it marks ■ full quarter century. Gone are the fine officials, timers ■ helping hands. Now, the AMA is on its own to do those things we have come to expect. Help is needed from all members: ideas, suggestions, your free time and labor. Drop your AMA representative a letter or give him ■ phone call. The Nats probably will change; whether they change in a way you approve or not depends, in part, on you. Let your ideas be known. If you can't be part of the solution, then you might just be part of the problem. The National Free Flight Society and other subsidiary organizations will be called upon for their ideas to run special events at future Nats. They will be seeking help and ideas. If you are a member (and you should be), let them know too. The idea ■ to communicate.

Navy photo of Jim McNeill, at the Nats '71, releasing his B Gas ship for an official. Note it ■ a pusher design!

While you are at it, drop ■ thank you note c/o The U.S. Navy, Glenview NAS, Ill. Twenty-five years of cooperation deserves no less.

New Newsletters: Now and then a newsletter which is timely, informative, and humorous comes on the scene. "Free Flight" and "Free Flight News" (England) are a couple that come to mind. Now add "Conn-Tact," newsletter of the Southern Connecticut Aero Modellers Association (SCAMA). It is edited by Ron Evans, 83 Blake St., New Haven, Conn. 06511 and costs $1.50 a year. News runs the gamut from the typical three-view of models through reports of Wakefield and Nordic Symposia and detailed discussions of technical data, to one of my favorites—the SCAMA Downdraft Awards. These awards are presented in most cases to individuals, publications or organizations which have done their best to demolish or slight the sport of free flight. Good reading—subscribe!

NFFS Symposium: This year's Symposium report, which is available from NFFS Supplies and Services, P.O. Box 322, Dallas, Ore. 97338, features some very special Downdraft Awards by Ron Evans plus the usual string of technical articles and the Ten Models of the Year. Each year these reports grow in stature and expertise to the point that they are now the single most quoted and authoritative source of information for the serious and inquisitive free flighter. Order yours now. While you are at it, ask for a NFFS supplies catalog —many special goodies just for you but not generally available at the average hobby shop.

U.S.A. FAI FF Team Finals: This month's column is being written just before packing up to head to Caddo Mills, Texas. Although published reports of the festivities will appear in the press, look to this column for a detailed report of the doings around the FAI Power area. Of all the technical advancements made in free flight during the past decade, the most striking and spectacular have been in Power—witness the almost universal use of pressure fuel systems, auto-stabs and rudders, and now flapped wings. (The foremost exponents of flappers in the world, Denmark's Tom Koster and Denver's Bill and Annie Gieskieng, will be present.)

BUD TENNY
INDOOR

Let's Communicate!: This column is dedicated to helping people learn more about indoor models, so, if there are particular things you don't understand about indoor models, help me to help you. Send your questions to: Bud Tenny, Box 545, Richardson, Texas 75080. Contest Directors: Give us advance notice about your indoor contests and flying sessions; make it possible for more people to know when and where they can fly their models.

Motor Stick Bracing: Properly designed motor stick bracing gives two advantages over an unbraced motor stick. First, for any fully wound motor, the stick can be much lighter if it is braced. Second, adjustable-tension bracing gives the flier an adjustment to control high power which affects only the climb during the power burst. This is accomplished by building a motor stick which bends under full turns loading, then limiting how far the stick will bend by using a bracing wire. The bent stick gives just enough downthrust (or down and sidethrust—see Fig. 1 discussion below) to keep the model from stalling under full power.

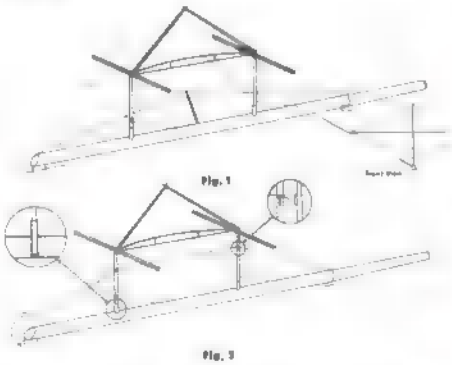


Fig. 1

Fig. 2

Bracing Methods: Motor stick bracing can utilize one, two or three wires; one-wire systems are the most popular. Fig. 1 and Fig. 2 show

Caught about a foot off the floor, Winberg's "Tenny Easy B" is about to land.

Note here size difference between Pennyplane (right) and Easy B (left)—both by Alan Riches.

the general arrangement of single wire systems. The most popular version is Fig. 1 since the angled post and thrust bearing allows the wing to be removed without disturbing the motor stick bracing. Adjusting the wire tension of this bracing gives both left and downthrust simultaneously the motor stick bends under the pull of the motor. Fig. 2's single wire setup requires that the fuselage brace wire be removable at one end so the wing can be removed. The most common arrangement is for the wire to have a loop which hooks the thrust bearing as shown. Since wire tension pushes down on the wing posts, the wing posts must be pushed all the way into the sockets and the bottom of the sockets must be reinforced with a balsa plug. This arrangement has two advantages with these precautions. First, downthrust and sidethrust can be controlled separately. Second, the only weight over an unbraced stick is the wire and the tiny blocks on the side of the wing posts to hold wire. Move these blocks up and down to control tension.

Important Note: All motor stick bracing should use tungsten wire at least .001 in. in diameter. This wire is available from indoor suppliers only. Other bracing systems will be discussed next month.

Radio Control

DON LOWE
SPORT AND PATTERN

Five Ways to Get Shot Down: Spotted in the "Valley Forge Signal Seekers News Letter" some experiences worth repeating—it might save you an airplane sometime. Bill Patterson writes about conflicting transmitters.

"Of all the ways to put a good ship into the turf, this one really hurts since about 99 percent of the reasons for accidentally turning on a transmitter are easily preventable. It is usually done by an uninformed or absent-minded individual. Fortunately, there are not many nuts around that would do this just for kicks. . . . Here are several situations which actually happened at our field or at other club fields:

"Some time ago, several young lovely visitors found their way out to the flying site and became intrigued with our model aircraft. They asked one of our fliers what makes them go and with this, he obligingly turned on his transmitter to show them. He forgot about not having the colored clothes pin snapped to his antenna.

"A couple of uninformed beginners had just purchased a Testor's Skyhawk but no one, not even the hobby department salesman, had told them about frequencies and interferences. Unknown to us, they selected a spot to fly about 300 yards from our pit area. It wasn't long before their transmitter caused another plane to crack up.

"When you have more than one transmitter, frequencies can be easily mixed up.

"One flier has two identical transmitters on different frequencies—both with detachable antennas, each with a different color frequency flag. You can imagine what happens when you attach the brown-coded antenna to the red-coded transmitter and then turn one on!

"Again the two transmitter man with his antennas properly attached, but this time snapped the red pin to his brown antenna and forgot to look up at his frequency flag to see if the colors were the same.

". . .One flier removed the frequency clothes pin from another transmitter which was apparently sitting idle, without first locating its owner. When the owner of the idle transmitter returned, he immediately turned on his transmitter without noticing that the frequency pin had been removed. If you have ever removed a frequency pin in this manner, I guarantee you will never do it again."

Does any of the above sound familiar? I'm sure it does if you've been flying very long. The problems range all the way from lack of proper instruction to the beginner to just

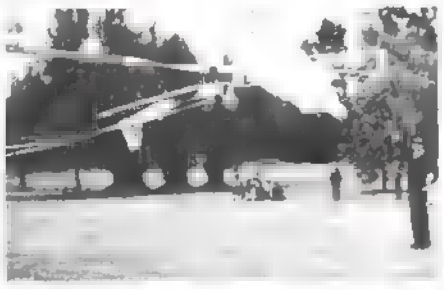
Herb Abrams and Don Lowe did it to them at Lancaster, Ohio, (FORKS) contest. Don flew Herb's ship out of the Judges' sight. Judges dropped their teeth when Herb handed them his X mtr with ship still in air and under full control!

Contestants and loot at Lancaster, Ohio Pattern contest. TV sets included!

plain carelessness on the part of the experienced flier. Believe me, it's worth a little extra care and caution to save a several months building job. Now, if you've ever been guilty of carelessly shooting someone down will you replace his ship? I hope so.

The winners at a recent fun fly event at Holden, Massachusetts. Left to right: Ed Eaton and S-Ray; Conrad Wondow Lowski and Brian Richmond with an AAM Simple-Fly. Looks like the youngsters did real well.

Manuel de la Concha of Club Colombiano de Aeromodelismo in Bogota, Columbia demonstrates a modified Simco with Kraft/Enya 60. Down there, they fly at an elevation of 8600 ft. above sea level.



Continuing the Safety Theme: Word from Charles Scaggs of West Germany suggests a safety check list to be used at home or at the flying field as appropriate. His suggestions are as follows:

Fuel—Know total burn time of tank in normal flying conditions. Top off tank before flight after continued ground checks. After a hard landing hold the airplane nose high and shake to cause fuel pickup to be in aft end of tank. A kinked fuel pickup can lead to an overlean mixture and engine stoppage.

Other Channels—Check with other fliers at the airport about frequencies. Position your work close to the other persons on your frequency. Use a frequency flat on your antenna. As extra insurance display your radio frequency number on your flight jacket and flight box.

Controls—With full batteries operate all servos to simulate flight conditions for the span time of your expected flights. Observe that the servos continue to move at the same rate. Servo response should be linear through the full travel, if not, the system may not be free of binding. This last item can cause a random failure of the servo. Recharge for 24 hours prior to flight.

Trim—Set for takeoff. Observe that trim movement is available for flight adjustments. It may be useful to mark the takeoff position with colored tape on the transmitter box.

Antenna—Remove antenna and perform range check. Check output meter if so equipped. Mark the output meter with plastic tape so any small change will be evident. Reinstall antenna tightly and in the fully extended position.

Traffic—Who is flying? What kind of flying are they doing? Perhaps it would be better to wait for a clear field with a new airplane.

Wind, Velocity and Direction—High velocity winds require high speed approaches to offset the head wind reduction at low altitude. Maintain power in the approach at a set trim for power glide, and do not attempt to stretch the glide or hold up elevator pressure. Be sure to take off into the wind. With strong winds, gain some altitude before starting turn.

Pattern—What direction is the established pattern? Are there alternate landing points around the field?

Full Throttle Check—Open throttle for a 20-second period, set mixture slightly rich for takeoff. The mixture strength will lean out during maneuvers.

Money-Saving Ideas: I received a letter from Walter Therien of Woonsocket, Rhode Island, who, though physically handicapped and shy on money, finds the resources to enjoy this wonderful RC hobby. One of his money-saving ideas has to do with extra-long drills for those hard-to-get-at bulkhead drilling or other jobs. He simply silver solders a standard size and length drill into a piece of brass tubing. The chuck end of the tubing is filled with solder and a piece of wire to keep it from crushing. He says that this drill can reach as much as 14 inches with a substantial savings in cost. Using the same basic idea, he extends an Allen wrench by silver soldering a straight section of wrench into a tube with a bent wire for a handle at the other end. Walt is a Sunday flier and enjoys all facets of RC modeling. He would appreciate correspondence from those of like interests. Write to him at 89 Crawford St., Woonsocket, R.I.

Painting Trim: Looking for an easy way to try out a star or other complicated shape for paint trimming your ship? Well, try contact paper, available at many variety stores. Simply cut the shape, peal off the backing, and stick on the model. The edges need not be sealed, and it will do a fine job of masking for brushing or spraying. We use this material for general masking where you want a sharp trim line. This hint was prompted by an item in the Long Island Drone Society newsletter, "Low Passes."

About Those Batteries: Treat your batteries kindly—do not abuse them or the results are disastrous. E. Boynton Jr. of Monroe, Connecticut writes that it is bad business to tug on wires in removing the NiCad pack from the Air-Sheen. He wraps a piece of nylon tape around the pack and leaves a tab extended for tugging purposes. Simple but effective. Others have suggested the same idea for removing a fuel tank which is wedged into the nose of the aircraft.

STOCKWELL PYLON

Races at Bakersfield: May and June were quite something in pylon racing. Cliff Telford and Ed Violett set a new world's record on the FAI pylon course with a sparkling 1:39.3. It was done with the same Supertigre they used at the World Champs last year. The previous records had already been broken by Garry Korpi and Luke Roy with a Roy-reworked K&B at the BIRDS' FAI races with a 1:42.0. With this kind of speed, one wonders why we don't go to cold fuel in the Formula I event.

But with lots of nitro (70 to 75 percent), Bob Smith and Larry Leonard proceeded to smash the 1:30.0 barrier that has stood untouched since Bakersfield over a year ago (it was Bob Smith that time, too). Smith was the first to go through the barrier, with a 1:29.8 at Bakersfield on June 4. Then Larry Leonard, starting fourth, topped it with a 1:29.4. Smith is not one to stand by while his

Stockwell and Weirick want to go to big props to slow them down. Garry Korpi demonstrates his new FAI prop at Valley Flyers race. It's certainly big enough.

Bob and Charley Smith at Valley Forge FAI race. Charley as CD did a great job, even if he and his brother win another one. Bob won four out of five.

records get broken. He borrowed a prop from Johnny Brodbeck with which Johnny had turned 1:34 while flying a course that could not exactly be described as tight. With it, Smith turned a 1:27.9. His course could indeed be described as tight—like right on every pylon for ten laps.

High nitro makes quite a difference in the new K&B Schnueries. Clarence Neufeld, who ended up second only to Bob Smith at Bakersfield, was mostly turning around 1:39 until he put 75 percent nitro in—he then promptly turned a 1:30.2. I thought his gold and white Stafford Minnow was the prettiest airplane at that spectacular contest. He had a perfect score, but couldn't get his engine started for the fly-off with Bob Smith.

The Bakersfield event broke all kinds of records. It was the largest RC pylon event in history with 95 entered and flying (there were 100 pre-entries). 119 airplanes for handicap judging which they accomplished in 45 minutes, thanks to the discriminating eyes of Jack Fabbri, Ed Morse, and Jerry Christensen—and though there are always some beefs, I thought they did a first-class job. In two days 155 heats and four fly-offs were flown. Twenty-five airplanes crashed—more dead airplanes than raced at 8 percent of the events outside California. There were 27 fliers who turned under 1:40 and more than 70 flights under 1:40. Four out of the five previous National champions were entered and racing, and all but one of the previous NMPRA Formula I and Overall champions were entered and racing. Probably the youngest Formula I flier in the country, Steve Sica, 11-years-old, was flying, and I expect that Ed Von Adelung, who also flew, is the oldest in the country.

If you're wondering why there were so many crashes, I think the increased speed had a lot to do with it. Four planes folded their wings going around the scatter pylon. If you're going to fly faster, you have to build stronger—more fiberglass and thicker wings. Bob Smith's wing is 1½ in. thick at the root, and former champ Jack Hertenstein's is even thicker. That should prove that thickness alone won't slow you down since to beat either of them you have to go under 1:30. Other crashes were a combination of radio failure—many probably induced by the higher vibration which more careful insulation in the installation can eliminate—and thumbs that were slower than the airplanes.

The old argument about how to slow them down has reappeared. I'm not sure it's valid. In spite of the horrendous number of apparently radio-induced crashes at Bakersfield, the flying was better than I've ever seen it. There was only one mid-air collison, and there were no crashes anywhere near the officials, fliers, pits, or spectators. More people were flying smooth, tight courses than ever before.

If we have to slow them down, we won't do it with rules about thicker, bigger wings or the like. We might require 11 x 8 props and allow sanding of one blade for balance. The most noticeable difference between good-and-fast and too fast seemed to be caused by the props and hotter fuel, not the engine. Joe Vartanian turned a 1:30.9 with a Supertigre, and Terry Prather a 1:32.5. No reflection on their flying, but I wager Smith could have turned his 1:27.9 with either of their air-

Bill Bone and his P-51 (Howard kit) at PROPS race, Redmond, Washington, May 13. "Where do I find another 3000 rpm?"

Dave Gjerke with spectacularly finished FAI racer.

planes and engines. The big props will take 10 to 15 seconds off anybody's time and cold fuel will take another five to ten off. Big props will make the takeoffs easier and safer and improve the acceleration, but slow them down in the straightaway. Maybe we ought to try it. Cliff Weirick's been pushing the idea for four years.

The really serious question about speed has very little to do with safety. The question is: If the experts continue to ■ ■ fast and get faster, how do we get new blood into the competition? There ■ many guys relatively new in RC who come to the races but feel unable to compete at those speeds. The event is too specialized. If very many guys take that view, the event will die. Since it is for my money the most exciting, spectacular, interesting and rewarding event in RC, I think that would be tragic.

K&B tried with their 100 Schnuerles to show that the rule allowing an engine to be legal if ■ minimum of 100 are produced is bad precisely because it contains the germ of self-destruction for RC pylon racing. They want the rule changed to ■ minimum of 1000. This would make a great engine available to more modelers, but it would also eliminate ■ small manufacturers who can afford to tool up only 100. No one wants that to happen. The point of this discussion is that this K&B is one hell of a fine engine. We've seen it beat some of last year's best competition, but we have not seen it race against the RAF or new Supertigre. Let's wait.

CARL MARONEY
GLIDERS AND FAI

An Idea to File: For those glider guys who have lightweight gliders and are caught at the field on ■ particularly windy day, whether thermal or slope conditions, Malcolm Wiseman's trick is ■ lifesaver. The idea is that increasing the weight of the glider at the CG improves penetration capability. Obtain ■ number of cheap wood files from local discount stores, and cover the files with electrical or masking tape. Next, the files, separately or in groups, can be secured to the wings. To maintain the original balance, it is important to use the same size and number of files on each side of the wing. Place the files underneath the wing close to the fuselage and secure them with stretched rubber bands over the top of the wing and looped over the protruding ends of the files. Placing the weight at the approximate CG will increase forward speed in windy atmospheres.

Mr. and Mrs. Paul Schweizer, left, are discussing the sailplane rides, which will be given to winners at the First Harris Hill Open RC Soaring Contest, with the glider committee of the Flying Sparks. The meet will ■ held on September 30 and October 1 at Elmira, New York.

Michigan Sweeps Maryland: The third of the 11 ECSS contests scheduled for 1972 had a large turnout of 51 contestants at the DC/RC Thermal Soaring Meet held on June 4. Contestants came from eight states: Connecticut, Delaware, Maryland, Massachusetts, Michigan, New Jersey, Pennsylvania and Virginia. Otto Heithecker captured the gold metal for first place and fifth-year veteran Earl Pell placed second for ■ silver medallion, both from Michigan's Greater Detroit Soaring and Hiking Society. During the six-hour contest a record-breaking five rounds were completed with 255 flights flown.

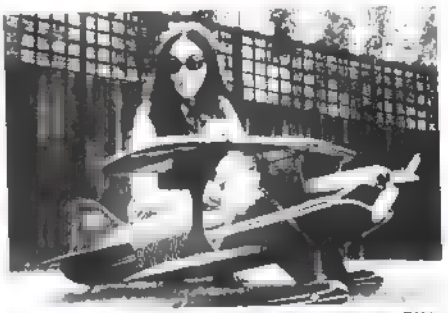
Several ■■ line retrieval winch systems were being experimented with. One system designed by ■■ Denny required two winches—one electric and one gas. Glider towing was performed with the gas winch. A line retriever, stationed halfway between the winch and turn around pulley, would pick up the down line and attach it to the close loop system. With the electric winch operating, this close loop system line retrieving took about 30 seconds. William Wargo utilized one electric winch having two reels. The large reel was used for towing and the smaller reel which free wheeled carried a tethered line out. Upon glider release, a hand lever shifted power to the smaller reel pulling back the towline off on the larger reel. Line retrieval took about ten seconds.

Homebuilts: Many ■■ products are being developed and hand-crafted by glider fliers each year. Most evolve out of solving personal problems or improving versions of existing accessories. Modelers marketing these ideas are invited to submit for publication in this column.

Fred Collins submits his innovation of a sun visor that clips on the bottom of the transmitter antenna. When caught flying near the sun, this viewing plate provides reduced glare and allows hands to remain on the control stick. Sun Visors are ■ green transparent plastic which measure about six inches square. The Sun Visors may be purchased for $1.49 each plus 25 cents postage from Fred Collins, 29 Stewart Ave., Pittsburgh, Penn. 15227.

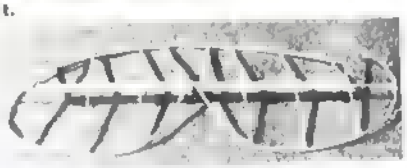
CLAUDE McCULLOUGH
SCALE

Sport Scale Takes Off: When the Scale Contest Board added Sport Scale to the 1972 AMA Rule Book as a provisional event, it was expected to be popular. What was unexpected was the extent to which it has pushed regular AMA Scale off the contest calendar. Dozens of annual meets which regularly used to feature RC Scale have replaced it this year with the new class. The Stand-off judging is much easier than lengthy measuring and checking, and undoubtedly appeals to contest organizers. The less detailed models called for in SS are welcomed by many contestants. Since steady advancement in the art of RC Scale has made top models literally of museum quality, requiring incredible amounts of time to build, it is perhaps understandable that the newcomer has taken hold instantly. But it will be ■ big loss for all scalers if ■■ established class, with its high standards, is reduced to ■ Nationals-only affair. There is room and interest enough for both events, and it is to be hoped that groups planning contests for 1973 will take ■ long look at the matter and find accommodations on their schedules for AMA and Sport Scale.



Robin Lehman's big O.S. 80-powered Pitts Special.

The problem of building a thin tail with scale structure to represent tubing was solved by Dick Graham who laminated thin strips of spruce together with Sig Bond. Strong and light.

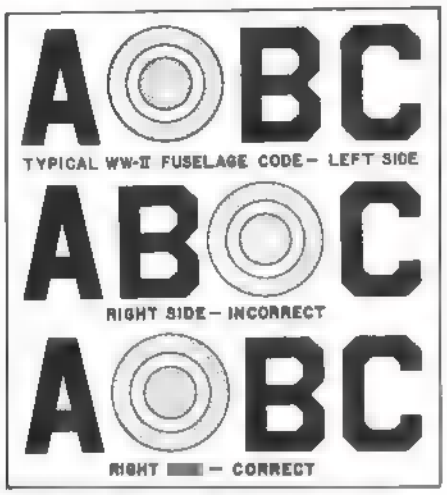


Point Spread: From reports it appears that the simpler judging called for in Sport Scale has sometimes been too relaxed. Just about anything with a name and color scheme has been awarded points near the maximum. With judging of this nature on the ground, the whole thing degenerates into just another event for pattern fliers, and it certainly wasn't established for that result. The judging from ten feet is not a provision for "anything goes." In all of the scoring sections the difference between a perfect model and a mediocre one is easily apparent from the stand-off point and should be marked accordingly. A widespread assumption has taken hold that, since ■ ruler is not laid on the model, any dimensional change from scale which happens to suit the builder can be made without penalty. Any competent judge of outline can detect increased dihedral, enlargement of tail surfaces, super-simplified cross sections, out-of-proportion components, and other faults even from farther away than ten feet. The same thing applies to workmanship differences.

It is human nature not to want to hurt anyone's feeling by giving his model a low score. Many judges seem to feel that they are performing properly if the best model at the contest is given a few more points (this is just ■■ much ■ problem in regular AMA Scale ■■ in SS) than others of much lower quality. High scale and workmanship quality is gained only at the expense of higher wing loadings, lower stability, more drag, and other handicaps. If the Scale events are to operate fairly and as intended, adequate compensation in the form of points has to be awarded to those who have made the effort in fidelity and craftsmanship. In short, high points for exceptional models, low points for poor entries.

Another example of lack of point spread regularly occurs in scoring for retract gears, multi-engines and flaps where, upon operation, the flier is automatically awarded the maximum possible score. This is unfair to other contestants doing aerobatic maneuvers in lieu of these operating features since only exceptional maneuvers are ever awarded full points. It is also discriminatory against the entrant with ■ perfectly detailed gear going up at scale speed with perhaps one leg lagging and doors closing over the wells to give maximum points to ■ bare wire gear snapping up like a mousetrap.

Flip Side: A common error is made by builders of WW II types when only one side of their subject aircraft ■ shown in the photo used to authenticate markings. They feel that because two letters are between the insignia and tail on one side that the same should be true on the other side for balance. The letter codes are actually ■ single letter representing the squadron or group. Separating the letters in the two letter group makes the code that of another airplane and organization. Incidentally, these codes can also appear with two letters in front of the insignia and one behind



on the left side, but the same rule applies in translation to the other side—don't split the two-letter combo.

Special Interest

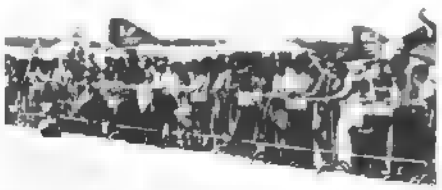
BOB BECKMAN
RC CARS

RC Cars at TRANSPO: The International Transportation Exposition (TRANSPO '72) at Dulles Airport May 27 through June 4 included RC car racing. The Washington RC Racing Association, with the help and cooperation of the AMA, ran demonstration races, passed out leaflets on RC cars, and answered thousands of questions.

The demonstrations were a definite success in spite of the fact that the effort got started late with very little in the way of financial resources. About a month before TRANSPO, Ed Pennewill pointed out to Bob Beckman (both WRCRA members) that the AMA was going to be demonstrating airplanes and it would be appropriate for RC cars to be represented. Bob contacted John Worth at AMA headquarters, and, with his help, the ball (I mean the cars) got rolling. On May 6, [illegible] and Bob joined the AMA group at Dulles to show the TRANSPO officials what RC planes and cars could do. Then the TRANSPO people had to decide what would be included. The RC planes were made a part of the air show and given two or three 10 to 15 minute slots each day. Since the RC cars wouldn't conflict with air activities, we were allowed to run in the product demonstration area on an "as available" basis.

We spent the three weeks before the exposition opened getting organized. The greatest concern was printed material to supplement the racing activity. It was felt that without something the spectators could take with them and refer to later much of the value of the demonstrations would be lost. Bob Beckman supplied text. Kelly Matthews, who had just finished the ROAR rule book artwork, did the art and layout. All we needed was the money to print the thousands of leaflets we would need. We contacted as many RC car manufacturers and suppliers as possible, ROAR's president, Bob Valyou, did some of the contacting. By Wednesday, May 24, we had enough support promised for the printing of 10,000 leaflets.

For safety and public interest, the races were to be simulated performance, but usually turned out to be all-out races and lots of practice.



In the meantime, meetings were held with interested members of WRCRA. We worked out a schedule to provide as many cars and drivers as possible over the [illegible] day show. In addition, signs were made, track markers and other equipment was gathered, and excuses were worked out for breaking up the Memorial Day weekend. Somehow everything came together Friday afternoon, and we were ready to go.

The first Saturday set the pattern for the show. The group arrived early to get a head of the crowds and get the track laid out. With a combination of police barricades (from New Orleans for some reason) and the Club's own flags, an area was blocked off and a small, tight track marked off inside. The track was small so the top speed of the cars would be kept to a minimum and allow spectators to be close without chance of trouble.

Each day while the track was being set up, one member of the RC car group got together with John Worth and the RC plane group to coordinate the day's activities. AMA's flight schedule was different each day and their flight area was about a mile from the track location. This required careful planning. Cars could operate until 15 minutes before RC plane activities were to start. At that time all car transmitters were shut down until after the AMA had completed their show. The system worked well; not once during TRANSPO did the car operation affect the AMA flight operations.

Once everything was set, a car would be fired up and start running the track. This would attract a crowd, and we would then schedule a "race," usually allowing ten minutes to get a good crowd. We tried to run a ten lap heat every 10 to 15 minutes and still keep one car going between heats. At times, there were people three and four deep around the track when we had cars dicing in the tight turns. In between races we passed out leaflets and answered questions. When the time came to shut down for the AMA flight show we were glad to have the break. WRCRA was able to get cars and people out for five of the nine days of TRANSPO.

On the last weekend we managed to get some additional exposure. Mark Donahue's winning Indy McLaren was in the Goodyear booth and Moe Dickey of WRCRA has a beautiful scratch-built model of last year's McLaren. The Goodyear people let us display Moe's model and a sign about our races with the full scale car. As a result, we had more spectators for the last two days.

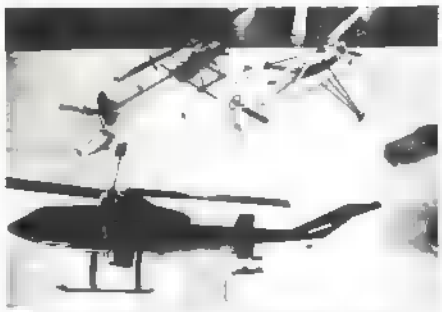
The official TRANSPO attendance figures are in excess of 1.5 million. At least 50,000 saw our RC cars, and approximately 8000 were interested enough to take one of the leaflets (we didn't just give them to everyone).

There is no doubt that the TRANSPO effort was a success. Local shops already have made sales which can be traced directly to the demonstrations at TRANSPO. In fact, the most frequent comment from interested spectators was that they had always wanted to do something like this but didn't know it was possible. This would indicate that there are a lot of people who would like to join us. What has been done in the past to publicize RC cars hasn't been effective. The manufacturers and dealers who have been moaning about the RC car market not developing as they expected might learn from the experiences at TRANSPO. The few firms which supported the demonstrations are getting some very inexpensive and effective advertising, apparently reaching the real source of new blood for our hobby/sport.

This whole thing could not have been done without the help of the AMA. It was a good example of how AMA and ROAR can work together to reach common goals. John Worth expressed AMA's thanks for new demonstrations of yet another facet of modeling, and his personal appreciation of the attitude and cooperation extended by the RC car group.

JOHN BURKAM
HELICOPTERS

Designing RC Helicopters: Since I wrote the article by that name in 1969 (published in March 1971 AAM), ideas have changed. The design procedure outlined is still good: write specifications, estimate size and maximum thrust from the chart, lay out airframe to ½ or ¼ scale, estimate preliminary weight and



View of a Hueycobra in foreground, Burkam's float-equipped model (great on snow, too) and dressed-up version of Gene Rock's chopper.

balance, full scale layout and detail design. Recommended revisions to the article, based on more recent experience, would be the following: 1) Increase engine size to 1½ to [illegible] times that called for in the article, giving a power loading of eight to ten lbs. per hp based on design gross weight. The added power gives more rapid control of rotor speed and lift which is especially useful in helicopters without collective pitch control; 2) Improve the arrangement and mechanical design of the fuselage and drive system along the line of the suggestions to follow.

Criteria of a Good Design: The design should be well integrated—everything should go together where it belongs using a minimum of structure. The landing gear, source of greatest loads, should be strongly connected to the engine and main rotor, the two greatest concentrated masses. The servos should mount easily where minimum linkage will connect them to the desired control. Everything should be easily accessible by removing a cover plate or two. Structure should be crash resistant but not overly strong where it is unnecessary. Shaft bearings should be close to gears or pulleys where heavy loads are applied. Special fittings should be as few in number and as easy to make as possible. Design for at least 100 hours life and maximum reliability. Protect servos and radio from oily exhaust fumes. Provide adequate engine cooling and easy starting by electric starter. Shrouding around the cooling fan makes it more efficient and insures its non-interference with aircraft handling qualities in forward flight, especially if the fan is horizontal and is out in front of the model.

An improved fuselage and drive system for Tuble, designed to satisfy the above criteria, will soon be tested and de-bugged and presented in AAM. Advance prints, not detailed, are available for $1, if you can't wait for the construction article.

Model Helicopter Progress: Gene Rock's model, much improved and de-bugged, with shaft driven tail rotor is really giving him great performance and satisfaction and many hours of practice. Len Sabato's new Jetranger with all gear drive and Hiller-type rotor system should take some of the market away from the German kits. Quite a few reports are coming in from people starting to build Tuble helicopters. DuBro Whirlybirds are selling like hotcakes. It is even rumored that an RC helicopter contest will be held on Long Island in September.

Readers: "Where the Action Is" is *your* part of AAM each month. The correspondents are experts in their fields, but they need to hear from you. Please keep them well supplied with your ideas, model photos, activities, club news, and newsletters. We pay $5 for modelers' ideas if used in a column; clubs are given credit.

Have a problem? If it is not too complicated, write to a WTAI correspondent. He'll know a useful answer and may even cover the question in his column. Write to the correspondent, c/o AAM, Potomac Aviation Publications, 733 15th St., N.W., Washington, D.C. 20005.

ing off one of the filler nipples for maximum engine duration. With both nipples open, engine run will be 15 to 20 seconds. With one blocked off, the run will be well over a minute. This can be done with short length of pinched-off tubing, or longer piece running to the pressure-tap nipple. With this latter system you don't lose the short piece in the grass while fueling—it stays attached to the pressure-tap. You can, of course, use a control-line tank and find the optimum setup yourself. However, the sortest fuel line is always the best, and use of the integral tank has the advantages of simplicity, strength, and aerodynamic cleanliness.

Flying

Launching may seem a bit hairy at first, but is really no problem if the CG is located approximately as shown. To avoid losing fuel from the inverted tank, turn the Charybdis upside-down and start as usual. Now grasp the hub area with your fingertips on the blade leading edge and thumb on trailing. Raise the whole affair over your head while simultaneously turning it upright; snap your wrist to start rotation, and push upwards. Then duck, and run into the wind, since you probably haven't got the carburetion right to begin with. Try again, until the engine continues to run and Charybdis climbs away like a startled mallard.

An alternate launch method is to gusset the general area of the CG, drill a small hole at the approximate center of rotation, and impale the Charybdis on headless nail driven into the end of a stick. In this case Charybdis will simply fly itself off once it picks up sufficient speed. McCutchen remarks that this is a good idea while getting the carburetion and balance unscrambled, since it prevents powered crashes while in an unstable condition.

Once properly trimmed, Charybdis is remarkably stable. The rate of climb can be varied by adding or removing clay, and by sliding the balance arm in and out. But this will not make as much difference you might think, and unless carried to extremes, will not seriously disturb autorotation characteristics following engine shut-down. If the Charybdis is really out of balance, of course it won't take off to begin with. Changing the stabilizer angle, on the other hand, will make great difference in rate of climb. An adjustable stabilizer, or at least a movable tab on the fixed one, would permit complete freedom of experimentation.

The other factor that most strongly affects performance is power. With the 3 x 1.25 standard .010 prop, time from launch to touchdown averages around a minute and 30 to 45 seconds. Charybdis climbs steadily for several hundred feet, depending on engine run, then descends in autorotation for anything from 30 seconds to minute. On one memorable flight of this sort, the Charybdis got hung up in thermal at 100 feet or so and just sat there, silently autorotating

over one spot for something close to two minutes. Total time was 3:15 for a rather different max flight.

But to really have a ball with Charybdis, try this: Turn the prop around to reduce thrust, or use a 4½ ■ 2 .020 prop, pile more clay on the balance arm, maybe try ■ masking tape trim tab on the elevator—anything to hold it down. It will take ■ while to work out, but you can get the Charybdis to hover waist-high. It will first sink to ■ grass-cutting level, then find an equilibrium altitude in ground effect at two or three feet, and just sit there, drifting with the breeze, following the contour of the ground. McCutchen rigged one to do this so well that it would go down the gentle bank of a stream, cross over, then climb the opposite bank and continue wandering off across the fields. He says it was quite upsetting to casual observers along the flight path.

While hovering like this, Charybdis will produce the weirdest sound you have ever heard outside a science-fiction movie. You'll think the Martians are coming—it is ■ kind of whoop-whoop-whoop-whoop gradually increasing in pitch and frequency, with an underlying humming note, and the scream of the engine. All this may be only a peculiarity of the author's Charybdis, and may not be true for others—even working from the same plans, everyone builds slightly differently. But for the Charybdis in the photos it's real. And strange.

Supreme

(continued from page 34)

Caution—drill this hole through the hub, but locate it at the edge of the shaft where the threads begin. Make sure the shaft is 90° to the hub.

Construct the nose block of six lb. density wood and face both ends with 1/32" plywood. Add to the back side a 1/8" sheet of eight lb. density balsa and 1/32" plywood. This keys the nose block to the fuselage. Put a 3/8" hole through the center of these pieces for the aluminum tube bearing retainer. Cut this 3/8 ■ .035" aluminum tube to length and drill ■ 5/16" hole in each end to ■ depth of .20". Install the tube in the nose block. Cut a 3/4" square hole in the front piece of plywood and replace with a 1/32" thick square piece of aluminum with a 5/16" hole in its center. Align this hole with the 5/16" hole in the aluminum tube. Install the two 1/8" aircraft bearings. The aft bearing can be held by crimping the tube. (I purchased the thrust bearing SFR2-53 and the radial bearing SR2-53 from New Hampshire Ball Bearings, Inc.)

Make the prop fitting which anchors the rubber from 3/16" mag plate. Cut out with a hack saw, file and smooth with emery cloth. Drill two holes with a No. 43 drill: one for the prop shaft to a depth of 5/16" and the other for the set screw. Tap the hole for the prop shaft with 4-40 threads. Thread the fitting on the shaft finger and drill lightly into the shaft through the set screw hole. Tap this hole with 4-40 threads for the set

screw which also serves as the prop stop. Drill a No. 43 hole across the fitting. Center a one-in. length of 3/32" dia. m.w. in this hole and epoxy in place.

The prop hinge fittings are made from 1/4" mag plate. Shape with hack saw, file, and smooth with emery cloth. Drill a 3/16" hole in each fitting which will receive the wood dowel from each prop blade. Position each fitting to the prop hub and drill a 3/64" hole for the .050" hinge pin. Peen the hinge pin in place.

I made a jig in order to carve the blades to a Schwartzback mean pitch of 31". Insert and cement pointed 3/16" dowels into the inboard end of each prop block. Insert this dowel into the mag hinge fitting when each blade has been carved, shaped, sanded, doped and a silk reinforcement added around the blade hub just above the exposed dowel. Set up prop pitch of 31" at 70% prop radius, and epoxy dowel to hinge fitting. Add prop spinner and drill hole through spinner, hub, and nose block for the two millimeter wire winding stop.

Add a compression spring between hub and nose block. Position stop screw with the nose block in place in the fuselage and blades folded. Shape and sand the nose block to the fuselage in this position.

The airplane is nearly completed. Add the DT hardware on stab and fuselage, button thread turbulators to the wing at 7% and 23%, snuffer tube, decals, and finally your name and address.

Flying

Make up a 16 strand motor 60" long, lube and install in fuselage. Position the wing so the CG is at 100% wing chord. Add two degrees rightthrust to turn the model right under power. Hand glide and adjust the rudder tab to give a slight left turn. If model stalls, add balsa shims under stab LE. If the ship glides too fast, add shims under the stab TE. Start with 150 turns and observe power pattern and glide. If ship stalls under power, add either more rightthrust or, if the turn is proper, add some downthrust. One or two degrees of downthrust should be sufficient. Add turns gradually as you tune the power and glide patterns.

With a 16 strand motor weighing 150 grams and flying with 240 turns I recorded a flight time of 106 seconds or a $\frac{\Delta t}{\Delta u} = .975$. Compare your time with this figure.

I made a winding tube from two plastic golf tubes butt spliced by wrapping with fiberglass and bonding with five-minute epoxy cement. I added an extension to my 8:1 winder with a length of 3/8" dia. aluminum tube 60" long. Now I never worry about blowing a motor.

My hope is to have a flying site where I can crank in max turns of 1275, observe that power run of 160 seconds, marvel at the altitude gain, and watch that slow floating glide back to mother earth.

I would welcome any questions, comments, or flight information you wish to exchange.

Hobby Shack

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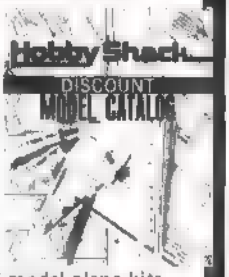

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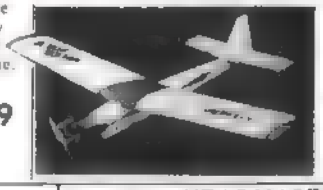

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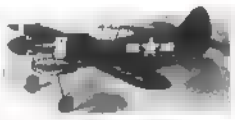

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The Taft Bash

(continued from page 39)

Motorcycles: Everyone chases on trailbikes since the terrain downwind is too rough for cars. It's also rough on the bikes, if the number of breakdowns and bent parts are indicative. It's a great way to retrieve, but it takes some getting used to. I'll swear I motored through a razor-blade bush while chasing during the night-flying event.

The Host Town, Taft, California: The merchants of Taft had banners welcoming the FFers, and the citizens made it pleasant to go the couple of miles to town for supplies or to eat or sleep. It's refreshing to feel welcome and know a whole town is getting behind a FF contest. Contrary to popular opinion, FFers have money to spend just like real people, and there are enough of them to justify more towns exerting a little effort to attract contests.

The Officiating: Things ran smoothly with few waiting lines for timers and few complaints. There were 634 entries, but it wasn't over-officiated or congested at all, which lent an air of informality most of us like. Clubs all over California pitched in to run specific events. The guiding force was Gene Spence of Taft, and the actual CDs were Al Vela and Sandy Norton—thanks guys.

We're not lost, anymore! We're over Taft.'

The Camaraderie: What a beautiful world it would be if everyone in it were as nice as the over 500 contestants, friends, wives, and kids who were involved in the meet. (There would have been 1000 if Grand Championship winner Jim Scarborough had brought his whole family.) Everyone had time to tell his story or listen to yours, and the bull sessions were rich as the top personalities in FF discussed the intricacies of the sport.

Tent City: Over a hundred living units, ranging from a tent made of cleaning bags and dowel rod to mega-dollar mobile homes, made the site look like a small city. It was a family affair for many, and the shared experience of camping really added flavor to the contest.

The Airplanes: The West Coast has long been the trend setter in free flight, but it was interesting to see the infiltration of Eastern-style high-climbers in the gas events. The tiny Texas-based "Mini Pearl" was probably the most frequently seen ½A design. There were plenty of Stardusters too, as well as

(continued on page 77)

BACHMANN MINI-PLANES

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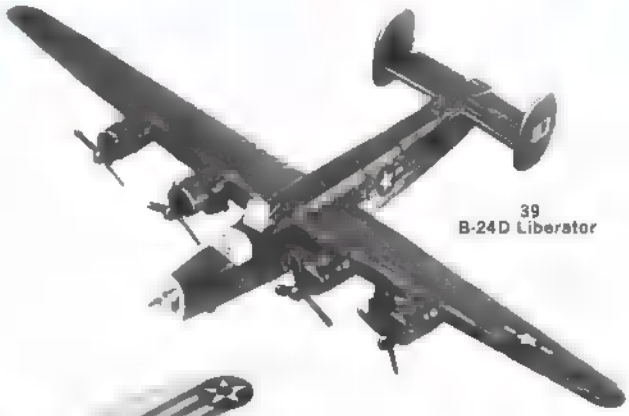
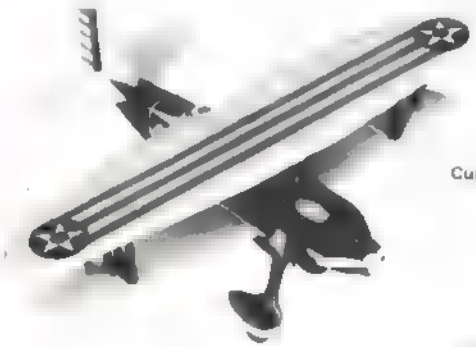


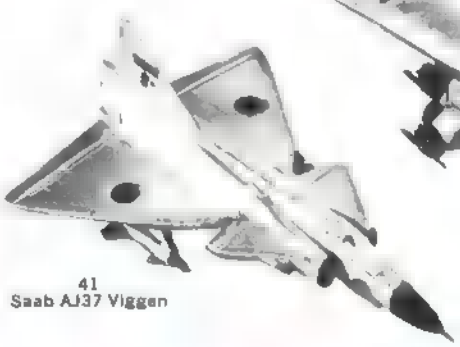
39
B-24D Liberator



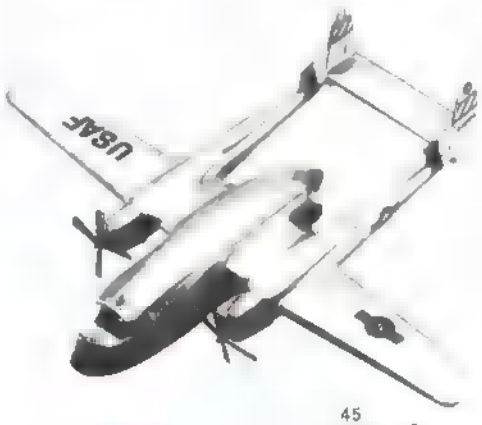
42
Curtiss P-6E Hawk

44
PBY-5A Catalina

43
Ford Tri-Motor



41
Saab AJ37 Viggen



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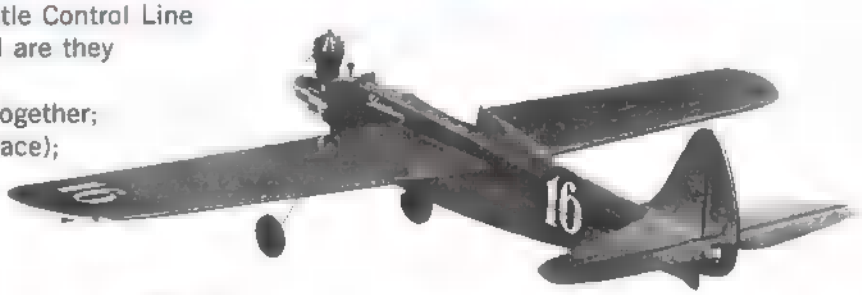

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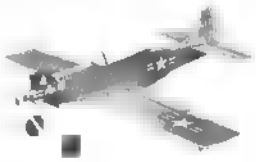

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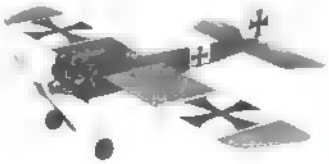

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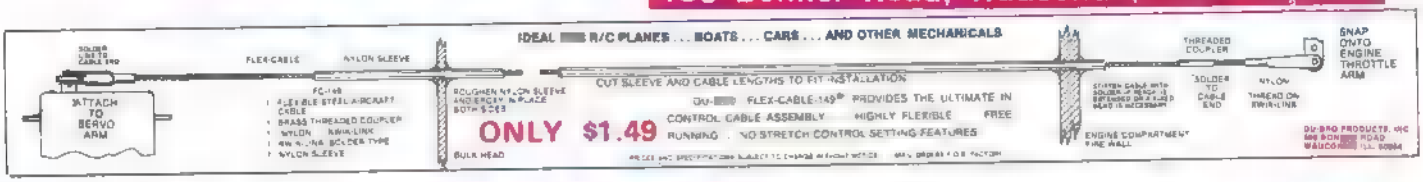

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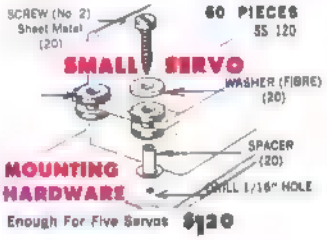

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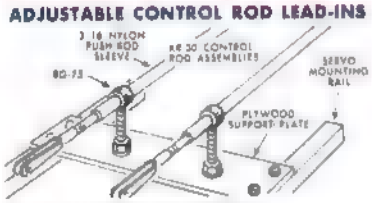

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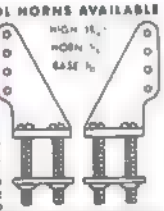

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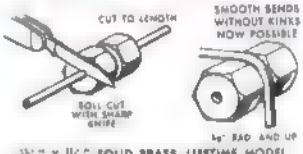

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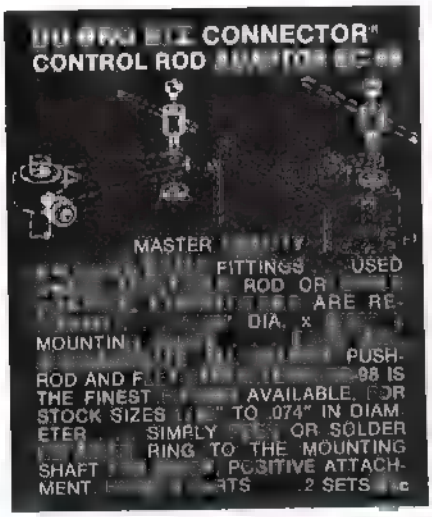

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The Taft Bash

(continued from page 72)

Satellites, Texans, Bogans, Hysterias, Rambunctii, Condors, and at least one of almost anything ever designed. No one design had a monopoly on victories either. Generally, most new ships seem to be shrinking in area compared to last year, possibly in response to the new reduced engine run flyoff rules.

Ed Bellinger's original Gysob repeated its Class C win of 1971, a very noteworthy accomplishment in such competition. Other repeat winners were Bill Hunter in D Gas with his own Satellite design, Bill Warner in Scale Power, and Harold Thomas in Coupe.

Night flying, which really is wild, was won by Mike Taibi (Starduster 900), with Texan Tom Peadon (Rambunctious 1040) second. Their hi-thrust ships were capable of over five minutes on a ten second motor run! Until you've seen night flying, you can't believe it.

To beat Harold Thomas in A Gas you would have had to do more than seven straight maxes. In fact, the times in every event were nothing short of awesome. Five straight maxes in HLG would give one a chance to flyoff with the top three. Nordic A-2 boiled down to Bob VanNest and Bob Isaacson with nine maxes each settling first place shortly before trophy presentation. The only two men left flying on the whole field, and they tangled towlines! VanNest prevailed by 25 seconds. Three of the top four Nordic places were won by Dragmaster designs.

The third best Wakefield flier in the world, Bob White (otherwise known as the "Godfather") handily won his event. Ed Carroll edged Bill Hartill in FAI power by 14 seconds using a high aspect ratio pylon design, while Hartill flew hi-thrust. The Old Timer events were hard fought (there were almost as many O-T events as all others put together) with Otto Bernhardt managing firsts in 30-second Antique Gas and Class A Old Timer.

It is interesting to note that the "name" fliers did not dominate the contest as much as was expected.

To be Grand Champion for the second consecutive year is a real feat which Jim Scarborough pulled off handily. His closest competition was Senior Champion Gerry Geraghty (last year's Junior Champion). Champion of the Junior was Randy Bunch. Second in Open to Scarborough was Gerald Dyer, who received the Open Championship award. Team Champions were the Satellite City group (Bill and Bob Hunter and Bob Deshields) who were professionally efficient in every way.

Bits and Pieces Which Stick in My Mind: Hardy Broderson's "C" job augering straight in from great height—no K&B RR 40 ever sounded like that. One kid haplessly throwing his HLG into a "Trash mover" (dust devil)—it went up and in several other directions simultaneously. One mass, at least ten gliders, piggyback A-2 launch into the world's biggest downdraft. Don McGovern and Vic Cunnyngham's prac-

tical jokes continuously backfiring (the bomb you planted on our truck before you left didn't work, guys, but it's the thought that counts). The kids having a blast flying, or just helping Dad, or just playing. How fresh the beauty queens, provided by Standard Oil (owners of the site), looked compared to the fliers who generally looked as if they had been on the losing side of a war. The OT ship, a Cavalier, I think, which kept flying into the same spot among the campers, but each time was caught in mid-air to great applause.

The tactical flying in HLG, a war of nerves with everyone standing around looking at one another. The great Texas vs. California glider team challenge, which Texas won. The beautifully decorated models everywhere—some rivaled dragsters for gaudiness. FF manufacturers comparing problems and sharing solutions. The help given by West Coast fliers to easterners unaccustomed to the conditions. How much longer five-minute maxes seem compared to three-minute maxes. Ditto for 15 second motor runs. The general absence of poorly trimmed, crashing airplanes. It could go on forever. . . .

The only thing lacking at the USFFC is tradition, but it won't be long because it's here to stay. FF everywhere will benefit from its success.

Bronco

(continued from page 89)

sprockets which drop from the main gears in case of turbo-prop damage and can't be reversed. With this knowledge, we can put a legal arresting hook system on the Bronco. Using brass sheet and tubing, I made a set of small hooks and mounted them into the elbow of the main gears with silver solder. I allow the hooks to release on takeoff, not using a hold-up device.

After sanding well, I used Ditzler light grey acrylic primer. This primer shows up defects, fills well, is light, and makes a great base for colors.

Wet sand everything with 600 wet or dry sandpaper. Use a vacuum and tack rag to get rid of the dust. I used Sig Supercoat dope. Spray the munitions pods and undersides Brilliant White. The dope is sprayed on dry, therefore from a greater distance than usual, and produces the camouflage dull finish without additives. Practice on scraps.

The green surfaces are Sig Forest Green with four oz. of Light Red added to each pint. To achieve a feathered color line on a camouflage paint job, run the masking tape through your

fingers once or twice to cut the adhesion. This allows the paint to underspray and give the desired effect. Mask off for green and spray. Use Scotch Brite to rub down the masking edge. Mask off the canopy and paint silver.

The prototype was painted as aircraft number 55470. The propeller warning bands are red, and the rescue markings are yellow.

Using Plastistruct tubing, make, install and paint the machine guns and pitot tubing. Add wing walks of 600 sandpaper. Add Star and Bar markings. Aircraft numbering and other markings are rub-on lettering. Aileron and spoiler outlines are made with ■ Rapidograph pen. Finish off ends of leadouts. Install engines with two or three washers offset to start with. You may want to remove some offset later.

Flying

Be sure the model balances on or in front of the CG shown on the plans. Be gentle on the controls, the craft will rotate! I used eight to six tri-blades for Scale and 8-5 to 8-7 double blades for Carrier. Make sure your lines are safe. Try to make a smooth takeoff, or the big bird may come in on the lines and lose airspeed. When flying Carrier, be sure the wing is at a positive angle to the deck. It may not be scale, but you will never get off unless it is. I set the inboard engine 100 to 200 rpms higher at idle to create ■ line-tightening situation. Don't bring the Bronco back into a stall position when the wind is at her tail. One look at the stabilizer area will tell you why. If it gets into this position, the model will rotate 90° to the ground and may become uncontrollable. Respect its size and uniqueness, and the Bronco may become your favorite model.

If you have any questions or comments, write me at 1951 East Concorda Dr., Tempe, Airzona 85282. I would like to ■ pictures of your OV-10A!

Good luck and may all your landings be 100 pointers.

Grasping the Infinite

(continued from page 26)

even at the height from which he started the dive, the speed bird took no time to reach the required speed run altitude. He did pull it out, but we noticed the engine beginning to sound a little erratic. Nevertheless, it ran the "invisible" speed course between the two electronic speed traps at a great rate of speed. Additional breathtaking runs were made before the engine abruptly cut, and he brought the ship in on ■ fast glide.

What a spectacular experience! No NATS we ever attended could come close in terms of excitement to the first 20 min. of this DCRC-run world record trial.

Maynard's associate, John Spalding, rammed the hand electric starter against the spinner and the engine quickly burst into life. Taking ■ couple of steps back, Maynard adjusted one of the two needle valves with the throttle control on his Logictrol unit and indicated to John to "let her rip." And rip she did—at a 40°

to 50° angle. As the ship gained altitude, with the setting on the rich side and the engine being revved up, the electronic tracking team began getting busy with their vast array of instruments.

Again that dramatic turn—bringing the plane on its back and then a graceful half roll. Down, down, down it came—a straight-down dive at rapidly increasing speed. The sharp pull-out and the official straight and level speed run came faster than we had anticipated.

No doubt about it—this was a good needle setting; it streaked across the traps like a bullet. Official time for the one-way traverse was 187 mph. However, this was the downwind run, and on the return upwind run the engine misbehaved again. This brought Maynard's official average down to 165 mph. If you want to lay claim to breaking the RC Speed record, you have to surpass the current record by ■ minimum of 2%. Germany, Werner Kaseberg in particular, proudly possesses the record speed at 198.8 mph.

Activity continued for three days: record attempts, soaring plane record attempts, and RC helicopter attempts. No one made more official record tries than Maynard Hill; nor did anyone encounter more trouble with erratic engines. Certainly no one worked harder or more persistently. Many younger men would have been put to shame by his abundant energy and ingenuity.

Tape recorders and audio tachometers were used by the Hill team in attempts to determine "in air" rpm. After a fairly good speed run with the engine strong and consistent, we heard Maynard proclaim: "one thousand rpm short." Yet that flight averaged close to 190 mph. We suspect that the next time Maynard tries for the RC Speed record, he will be a very hard man to beat. Contributing factors are ■ change of attitude toward speed engines and the speed merchants who have struggled for so many long years to bring the modeler's engine to the current state of art.

Maynard's approach towards the speed course was mesmerizingly bold. Real dare devil piloting. Barreling fast, the RC bird sizzled through the first two "lineup" markers. Past the first electronic speed trap, engine screaming bloody murder. Tearing across the invisible course with deafening, dynamic majesty. Through the second traps and then nosing up steeply. Instantly Maynard throttles way back. Even at this low throttle setting the speed bird climbs rapidly into speckhood. The ST 60 ABC chokes and stops for lack of fuel. It comes to rest on smooth grass ■ few feet away. You can almost hear the loud silence.

Maynard walks over to the timers who [illegible] still in controlled frantic activity. "How was that pass?" Chief timer Stu Vance: "I'll call our altitude man." "What was that pass like?" Answer: "Entered too high, exited a little too low, middle of run good." Maynard, on walkie-talkie: "O.K., will try to correct on next run. Thanks, out." And he did correct it. Over and over and over.

We don't want to slight our longtime friends and former CL Speed competitors, Bob Violett and Cliff Telford. They too were busy; most of their speed runs were close to 190 mph and the latest one was something to behold.

Unlike Maynard, who gained a lot of speed on those fantastic straight-down dives, Bob (the pilot of the team) brought their RC speed bird in at ■ lesser angle. On this run the ST 60 ABC was right in tune and screaming like the devil. On the downwind run it shattered the air at 197 mph. The entire speed run between the traps was done with one wing down, banked to the pilot. Still the bird tracked straight and true. Upwind time was 193 mph.

Later the team clocked speeds over 200 mph, but half of the speed run was always a little too slow to bring their average time up to the required 203 mph.

Both teams hand-launched their respective birds differently. Maynard's was released at a fairly rich, slow engine setting, then quickly brought up to a rich rev. The Violett-Telford team, however, revved up the engine to peak. The high-pitched roar shattered the air, and spectators instinctively stepped back as Cliff released the burden tugging so fiercely. A majestic sight: music to the ears of speed merchants everywhere. Not without their problems, this team of commercial airline pilots by trade would "total" the ST 60 ABC job one day after Maynard did the same with one of his ships. A real crime, for as even Maynard admits, Bob Violett builds beautiful aircraft.

Maynard's went first. Very soon after the release of the craft, he noticed ■ 50 ft. altitude, but nevertheless struggled upward. Someone had forgotten to turn on the switch in the plane. "Heads up" was the loud cry as the bird continued at a steep climb. The engine proceeded to peak itself out, and it flew around a bit with the freedom of an eagle—the inevitable just moments away. The speed plane reached about 400 ft., banked into a tight turn and dove at close to record speed into terra firma.

Not long afterward, Maynard was painting the sky with flights of over 200 mph, though that needed second pass was ■ constant source of heartbreak. He was using his second speed bird—identical to the one he "totaled."

Sunrise gave birth to the second day of record attempt achievements. Gentle breezes and blue skies promised another day of perfect record-breaking weather. Conspicuous by its absence was the Telford-Violett team, nowhere to be seen. Not until two o'clock in the afternoon did they finally show up with one of their speed jobs. Working all through the night, Bob tried to iron out ■ critical radio range problem he had the first day with both ships. Almost everything, including pulling the equipment out of the planes for endless ground range checks, was tried.

As soon as the RC gear was tucked back into the fuselage, the range would drop dangerously below safe limits. Aggravation mounted as hour after hour

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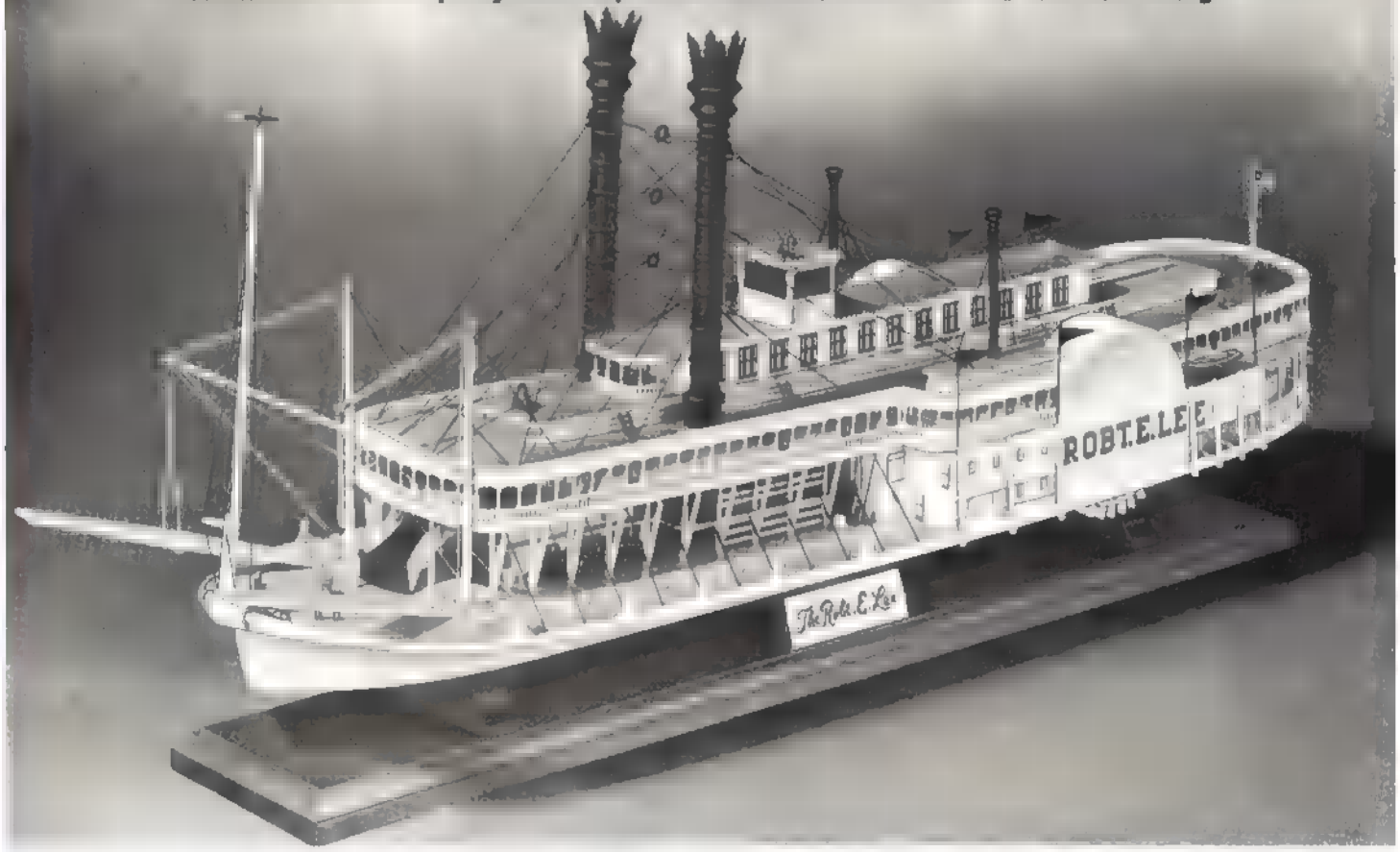

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No. 0901, Sorcerer — Pee Wee 02-powered, free-flight flying saucer uses sheet wing, easy to make by Tenderfoot builder. $1.00

No. 0902, Cloud 9—Intricate contest winning Wakefield by Roger Gregory. Plan shows streamlined prop/hub design. $3.50

No. 0904, Antoinette—Signorino/Zundel RC 98" wing, nearly scale, flies well on .36, like powered glider. Plans 3 huge detailed sheets. $9.00

No. 0905, Mini Cat—Bud Atkinson scaled down the Cat series, for pulse or light digital and up to 19 engines. Easy to make RC sport flyer. $2.75

No. 1001, Phantom—Well-engineered RC Dyna-Jet-powered scale fighter by Ralph Saldivar is practical but noisy model. Highly detailed plans. Jet installation shown. $4.00

No. 1002, Hobbit—Simplified Nordic A1 by Bob Stalick is steady on tow, all weather flyer. $1.50

No. 1003, Charger—½A powered sweptwing stunter does full pattern on long lines safely. $2.00

No. 1101, Autopiro—Simple 049-powered model builds fast and gives unique performance. Pusher prop or motor. $1.25

No. 1102, Aerobile—Large scale CL or RC of a famous Waterman roadable plane. Uses 45-60 motor. Wing detachable, car drivable! Large single-sheet plane. $4.00

No. 1103, Akromaster—RC scale/stunt model of real aerobatic plane for 45-60 engine. Fast and responsive, easy to make, simple shapes. $2.75

No. 1104, Tardon—Formula II semi-scale pylon racer or stunt plane for ■ engines. Won event ■ ■■■ NATS. Groovy flier. $3.00

No. 1201, Stiletto—Unique ½A proto model uses much-extended motor shaft for clean prop thrust and speed. $1.00

No. 1202, King Kong—Huge flat-land ■■■■ for competition use has 12' wing of glass, foam, and balsa. By Sarpolus. $3.25.

No. 1203, 10-Hi—Six-foot span, 049-powered flying wing is high-performance model with sporting flair. Huge plan. $3.50.

No. 0111, Dragonfli — Fast graceful competition stunter by Phil Kraft. Uses ■■ ■■ and retracts. $4.00

No. 0112, Toothpick—Long thin winged combat CL ship is both fast and quick turning. For hot ■■s. $2.25

No. 0113, Luton Minor — Delightful 10-powered semi-scale RC for three light servos is high-winged parasol monoplane. $2.25

No. 0211, Cobra—Steve Wooley's great, smooth-flying CL stunt ship for ■■. Light model, ideal for both FAI and AMA patterns. $3.50

No. 0212, Voodoo—Converted Goldberg kit for streamer-towing RC combat, by Ed Sweeney. Two ■■■■ with ■ engine. For new event. $2.75

No. 0213, Guillotine—Modified from CL for RC combat. Manuverable, fast, responsive, and fun. Glides well. For two servos and 19 engine. For new event. $2.75

No. 0312, EKKO—A compact FAI pattern and sport model for 35 engines. All wood low-winger. $3

No. 0314, Skydancer — Two-channel-equipped RC boost glider using aileron and elevator control. Lofted by new, powerful rocket motor. $2

No. 0411, P-51 Mustang—Semi-scale 60-powered with ARF Lanier or Dee Bee wing on balsa fuselage. Realistic and quick construction. $3.25

No. 0412, Grouper—Unique in appearance, oval balsa fuselage hides a ■■ 60 engine. Easy-to-make stunter for commercial ARF wings. $3.25

No. 0413, Dauntless—Low-wing scale profile FF model for sport flying ■■ inexpensive 020 engine. $1.50

No. 0414, Nesmith Cougar—Accurate ■■■■ CL model of boxy homebuilt. Fine beginner's scale model using 19. A winner with detail. $3.50

No. 0511, Five Wagon—Contest free flight model for ½A, by James Clem. Diagonal-ribbed wing resists warps. $1.75

No. 0512, Platypus—Unusual-looking RC aerobatic seaplane, made with balsa-covered foam blocks. Uses a ■■. $3.00

No. 0513, Troop Glider and Tug—Two models, one ■ twin-engine, 19-powered C-46 Profile, the other a scale CG-15 troop carrying WW II glider. Both on one large plan. $2.75

No. 0611, Phatom Stunter—Very realistic jet-like model of Blue Angels plane with typical stunt moments and airfoil. For 35-45 engines. $2.75

No. 0612, Crusader Stunter—Anhedral wing, ventral fins and full array of missiles and drop tanks. It ■ a unique but truly competitive flyer on ■ 35 ■■ 40 engine. $3.00

No. 0613, Simple-Fly—Semi-symmetrical CG airfoil low-wing on box fuse. Performance for beginner on 29 or novice contest ship with a 50. $2.50

No. 0614, Sopwith Pup—Single or multi-channel, nearly-scale model for 10 to 19 power. Highly detailed plans. Stable flyer. $3.50

No. 0615, Santana—Jon Davis' contest-winning towliner A/1. Uses fiberglass boom, stiff wrap-resistant wing. $2.00

No. 0711, Phoenix 5—Don Lowe's latest in a series of swept-wing competition stunters for 60 and retracts. $3.00

No. 0712, Bonanza/Debonair—Build either V-tail or conventional version of this popular fast flight plane for full-house radio and a strong 60. Fine-flying ships, foam wing construction. $5.00

No. 0713, I.F.O.—Would you believe a FF 020-powered flying saucer which really ■ies? Built-up construction looks real. $1.00

■■. 0714, Helldiver—Semi-scale CL model of WW II torpedo bomber builds fast and is rugged. $1.50

■■. 0811, Douglas Mailplane—Large FF scale of Western Air Lines M-2 bipe. For 09 power. Could fly with light radio. $3.00

No. 0812, Hot Canary—Unique Formula II/FAI racing biplane by ■■■ Sigelkoff. Although unusual-looking, it is fast and quickly built. $3.25

No. 0813, Pogo—Model of Owl Racer for Formula I features midwing, low stab, non-cheeked cowl. Very stable and plenty fast. By Bob Morse. $3.50

No. 0814, Flying Fortess—Not a scale plane, but a novelty CL flying medieval ravtol for a 19. $2.75

No. ■■1, Fletcher—McCullough's magnificent tri-geared, low-wing crop duster scale job for 60's. Generous area and moments. All balsa. Highly-detailed plans on 2 sheets. $7.50

No. 0912, Killer—Fast, responsive combat plane. All-balsa for 35's has many wins. $3.00

No. 0913, ACE High—Featherweight 049-powered RC glider uses a set of ACE R/C foam taper and constant chord wing sets. $2.25

No. 0914, Sakitumi—Highly-developed 40-gram Wakefield plane by Brian Donn features latest trends in gadgets and design. Well-detailed plan. $3.00

No. 1011, FAIMac—Competition FAI free flight job for screaming 15's. Simplified construction with warp-preventing wing. Build a winner. $2.75

No. 1012, Peregrine—All-out RC slope soaring racer for ailerons and elevator. Balsa fuselage with foam wing. $3.50

No. 1013, Hi-Pro—Highly proficient slope/thermal soarer. Build several versions from these plans. Balsa wing and glass fuselage. $3.50

No. 1015, Marut—Named for the Wind Spirit. Designed for windy weather CL contests. Large-size jet appearance uses 45 engine. Two sheets. $4.50

No. 1111, Longster—Large-size free flight scale ship for 09 power, also ideal as small RC. Construction similar to real plane. $2.75

No. 1112, Buster—Built-up profile Goodyear racer well-streamlined and a winner. For hot 15's. $1.75

No. 1113, Bippi-Bipe—Delightful scale-like rudder-only or GG model for single channel and 09 engine. A fun plane. $2.75

No. 1211, Fireball—Jim Walker's great design presented as it was by Bruce Lund. For ignition 23's or smaller on glow. $2.50

No. 1212, Brooklyn Dodger—Sal Taibi's great old-timer FF job presented as it was by Bob Harrah. For ignition 23-35 or smaller glow engine. $1.75

No. 1213, Canus—Sixty-powered and large-size FAI aerobatic RC plans. Very quick building. $4.00

No. 0125, Firecracker—FAI scale RC pylon racer with special fast airfoil and homemade retracts (in text), a winner by Bob Root. $3.50

No. 0121, Penguin—Unusual scale CL flying model of post-WWI pre-flight trainer. Simple and RC-able. Uses 19 to 35 engine. 3-views on plan. $2.50

No. 0122, Pay-Up—TeeDee 020-powered AMA Pay Load event winner also nice for sport FF. Simple and sturdy. $1.50

No. 0123, Nifty Novice—049 thru 15 power for monoplane or biplane Tenderfoot CL trainer. With power, bipe is stuntable. SPECIAL PRICE $1.00, decal included.

No. 0124, P-38—Semi-scale WWII fighter with single 049 flies rudder-only pulse RC with ACE mini-foam wings, others usable. $1.25

No. 0221, Big Flapper—Large high wing ■ docile flyer for a 60 engine and 4 channels. Nice trainer/sport plane. $3.50

No. 0222, BV-170—Three 35's power this sort-of-scale German profile fighter. It is big, pulls hard in flight, stunts too. $4.75

No. 0223, Canard Drop-Off—Rubber pusher sport flyer drops its prop and rubber when unwound, then drops a piggy-back glider. All balsa and flies great. $2.00

No. 0224, Cardinal—Excellent FAI European-type RC pattern plane of foam/balsa construction. Up-to-date ship if for 60's, suitable for retracts. $4.50

No. 0321, Turbo-Pilatus Porter—Fine flying CO2 or Rubber powered FF scale model and scale floats for ROW. All on one plan. $1.50

No. 0322, Little Bird—Midwing RC pattern plane handles wide range of power up to 71's, yet is small in size. $3.50

No. 0323, Two For the Show—Biplane CL stunt for 049 ■■ Dee. This one offers precision flying in small areas, great for practice. $1.50

No. 0324, 2T—ACE-foam-winged RC trainer for ■■ power carries 2-channel bricks with ease. Ample wing area for long glides too. $2.00

No. 0421, Quarter Pint—A 020-powered Tenderfoot free flight patterned after an antique design of 30 years ago. With decal. ■

No. 0422, RCX4—Bat-like winged sport RC plane for big motors, 4-channels, and crowd pleasing flights. $4.50

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No. 0423, Squeeze-Banger—FAI combat anyone? Fast flying 15 ship from Canada ■ a winner. $2

No. 0424, Dragonette—Compact version of Kraft's Dragon Fl ■ hot ■ and flies just like ■ big one—fast and smooth. $3

No. 0521, Satellite 1000—Huge and highly-detailed plans for one of FF's most winning designs. For screaming 40's. $8.50

No. 0522, Lil' Rebel—Fast and very durable 15 Goodyear CL ■■ ■ ■ consistent winner. $2.25

No. 0523, Pegasus—A take-apart RC job designed for transportation in its own box. Full house with ■ 19, stunts well. $2.50

No. 0621, So-Long—miniaturized Old-Timer for 020 power event and sport flying. Easy to make. $1.50

No. 0622, Daylight Special—Well updated four-year-old Forum I racer by doBolt has many unique features for speed. All balsa construction. Two-sheet plans. $2.00

No. 0623, Chance Vought "Skimmer"—U.S. Navy experimental shipboard fighter is real flying saucer. For profile carrier events, by Frank Scott. $4.50

No. 0721, Douglas Devastator—Navy Carrier competitor for 40 or 60 of colorful shipboard fighter. A tough plane and a winner. $3.00

No. 0722, Wizrod 350—Ron St. Jean's combination of past FF power winners in a 350 sq. in. 049 ■■■■■. $1.75

No. 0723, Quickie Mk 4—RC competitor for Class A and B. Conventional looking low winger flies easily, builds very fast. $2.00

No. 0821, Capstan—For one- ■ two-channel RC, a small sport/scale all-balsa glider. Has ■ fine glide. $2.00

No. 0822, Nemesis II—Howard Rush's winning AMA Combat ship. Ultra-light, balsa and silk, very quick. $2.25

No. 0823, Apteryx—New style Mylar-over-foam wing on fast, tough, AMA Combat plane by Robert Mellen. Construction offers perfect airfoil and tapered wing. $2.25

No. 0824, Ryan SC—Unusual 049 free flight scale model is low winger with excellent flight stability. Flies fast and handles wind easily. $2.75

No. 0825, S.S.P. RC Helicopter—Gene Rock's simplified and well-proven design for home builder needs minimum critical machined parts. Features belt-drive, 45-60 engine, gyro stabilized main and tail rotors. Large, highly detailed plan is full-size including sub-assemblies. $6.00

No. 0826, Full-size drawings for making special machined parts ■■ Gene Rock's RC Helicopter. Not essential, parts are available from Stock Drive Products, Inc. See article. Parts plan only $2.00

No. 0921, Hot Pants—Jerry Nelson's large-bodied, realistic-looking, home-built type RC Pattern design. Smooth flyer uses all-moving stab. $4.00

No. 0922, Aqua-Vent Floats—Simple curves make these easy to build. Sized for 15 to 30 powered planes. Designed for quick lift-off with low power. $2.50

No. 0923, Vertigo—A CL vertical take-off-and-landing biplane. Uses throttled 19 for power. Really flies, lots ■ fun. $2.75

THIS MONTH'S PLANS

No. 1021, Bronco—A Class I or II Navy Carrier plane for two 19s or two 20s of the OV-1A C.O.I.N. fighter. Two large plan sheets. $6.00

No. 1022, Lockheed S1—Unique highly-detailed scale biplane of Lockheed's first airplane. Original dates to 1930. Design by M. Groves, uses a 49. Two sheets. $7.00

No. 1023, Quasimodo—An odd-looking four-channel RC Sport job for 35s. Shoulder wing, tail dragger. A fun flyer. $4.00

passed with the solution nowhere in sight. Sundown threatened; Maynard and company did not take much notice of the Telford-Violett team's dilemma—they were much too busy flying like crazy.

Trying desperately to avoid the range-caused crash of their ST 60 ABC ship, Telford and Violett labored right into darkness, taking no chances. Their last ship was a TWA tuned-pipe job which held a great promise of clobbering Werner Kaseberg's 198.8 mph mark.

Only the day before they had taken just such a chance with disastrous results. Cliff Telford launched the ST 60 ABC job dead level. The speed bird tracked nicely about seven to eight feet from the ground, engine burning the calm air. Without warning, the ship did four or five beautiful consecutive fast axial rolls to the left. Turning on its back, the bird met the ground a few seconds later. After picking up the pieces, the team walked over to their equipment-filled station wagon and pulled out their second ship—now sporting the tuned piped TWA 61. "We're not through yet," Bob exclaimed. All that remained now was installing some of their Pro-Line gear into the ship, a mere technicality. Bob would labor once again all through the night.

Some spectator noting Bob Violett literally sweating while trying to overcome the radio problem as darkness was beginning to close in said "Why don't you guys give up?" Neither Violett nor Telford even bothered to look up, or perhaps they really didn't hear him. For a moment there was silence. Then one of the DCRC members who heard this said, " 'give up,' never heard that expression before, is it English?" Looking downward and wearing a slight grin on his face, we heard yet another DCRC man say, "oh, it's in the English dictionary all right. It just isn't American."

Back to the motel they went while Maynard and company drew out two giant altitude planes and started the detailed preparation for an onslaught at his own altitude record of 26,919 ft.

At the conclusion of the three days at Dahlgren, we asked Maynard Hill, Bob Violett, Cliff Telford and Stu Vance to write their throughts on their personal efforts. Read on as the participants unwind their struggles.

First, Maynard Hill: "My impressions! Over the Labor Day weekend of record trials, DCRC and Dahlgren RC Club members probably contributed over 500 man hours to the effort. To me it's a great feeling to be part of such a huge team effort. CD Tom Carey deserves a lot of credit. He and Stu Vance proved that the basic system is capable of giving accurate measurement to .05 sec. This is contrary to the previous belief of some people. When the model is down within the prescribed course and altitude, Stu's crew obtained results accurate to within two percent at 200

mph. Clearly they were good enough to demonstrate once again that there is some sort of "barrier" at 200 mph. Haven't Gussinger and Smith, and now Telford and Violett and I appeared to bump hard into it? There are now over 80 timed passes that sit around the 185 to 195 mph (averaged of two-way speed runs) and the timers haven't once granted us an official record.

"It does look like a super engine will be needed to get above 200. We weren't exactly using putt-putts out there, so it may still be available before the record falls. I had a great team. We were busy as bees in a honeypot as we tried every trick in our bag, including *high* nitro fuels that would burn a hole in your pants. We were making progress but not enough to get to the goal before we made splinters out of two speed birds. My team was definitely the underdog since I can't make the immaculate airplanes that Bob Violett produces, nor could I make an engine go as fast as Cliff Telford. I've had a lot of fun and excitement with models, but this weekend was the greatest ever. I promised my crew I'd try harder to polish the bumps off next time, but it remains to be [redacted] if I'd try again. After six years of it, I'm beginning to think RC speed is not my bag.

"It wasn't bad when I set the old record (1967) at 140 mph, but 200 is something else again."

"Werner Kaseberg, I salute you, one more time."

(That doesn't sound like the Hill we saw out there. Besides, some day in the future we would like to try for this RC record, and we would like to be able to say that we beat out Maynard Hill.)

Next, the brilliant Stu Vance: "The judges need no special training, but the corridor judges must be in the edges of the line of flight of these 200 mph missiles. It takes courage, steadiness and perseverance over several hours of intermittent speed runs. We have normally found it impossible to keep one set of

course judges on for more than half a day, and they probably do not do the job more than once in a Records Trial period. The altitude judge, particularly, is in a dull and repetitive job since he is stationed perpendicular to the center of the course at a distance of 900 yds. and thus feels left out. We keep him equipped with a walkie-talkie so he knows of the action, and we converse with him from time to time to keep him happy.

"Timing depends upon two expensive electrical chronometers calibrated by an official calibrating agency (at this meet the U.S. Naval Ordnance Laboratory near Washington, D.C.), with each clock connected to a set of buttons, one at each end of the 200 meter central section of the course, and in the hands of two persons. The complexity of the problem is not recognized until one realizes that the speed plane passes the trap in less than two and one half sec. and that reversal of course takes less than five sec. This means that timers must locate the aircraft, anticipate the point at which it passes the timing pole, fix on that (with no possibility of parallax between timers), see the plane come into their field of view, push the microswitch buttons, and then prepare within from five to seven and a half seconds for a pass from the other direction. A typical speed attempt consists of five passes through the trap, either three upwind and two downwind or vice versa. This function is performed by the chief timer. He has three assistants—two assistants each to read one clock and a recorder to record their called out speed."

Lastly, the airline pilots Bob Violett and Cliff Telford: "There are several problems involved in attempting to break the world speed record for RC models. A few of the more pertinent facets of this endeavor may be of interest.

"The aircraft must be structurally stronger than any other type of RC model. Primary differences are in the wing construction and engine installation. Wings, used on 40-powered pylon airplanes, are not strong enough. Extra sparring of the foam cores and an increase in surface tensile and compression strength are necessary to prevent twisting and bending. The aerodynamic loads at 200 mph are considerably more than at 150 mph. The engine mount must be very firm and able to withstand the G forces induced by a .60 turning 20,000 rpm. Meeting these requirements and still keeping the machine under the required FAI wing loading is a difficult task.

"Control surface size, movement and method of hinging are other areas of dif-

ficulty and peculiar to a speed vehicle. Any hint of surface flutter at 200 will result in uncontrolled flight and probable loss of the airplane.

"I have built three of these airplanes and am presently drafting the fourth, and hopefully final, design. A fiberglass mold for the fuselage is a must. It will save weight and space and reduce construction time.

"Pro-Line Electronics is working with us to try and solve the problems, and perhaps what evolves might slow the attrition rate of pylon airplanes which have the same problems but to a somewhat lesser degree. One cannot compromise on surface rigidity and positive control because it is difficult enough to fly the airplane through the course without spongey control response.

"Horsepower is a most necessary ingredient. The record that stands now we think cannot be broken by the two percent margin with available engines unless they are augmented substantially with tuned exhaust systems or mini pipe supercharging. Every gimmick that is added, however, has its associated problems and thus further complicates the effort. Cliff is the power-producing half of the team, and is applying his 20 years CL Speed experience to our goals. We now know how much is needed and the best way to get it. That, of course, is a speed secret and cannot be devulged at this time.

"Results: One of our speed birds was powered by a Supertigre 60 ABC. The best run on it was 198 mph into the wind (eight mph). The downwind run was missed because of a clock malfunction. I flew too low on this pass, and the run would have been negated anyway. This airplane lasted for two test flights and three official flights.

"Our second plane was powered by a Wisniewski 61 TWA. The best flight on this was again 198 mph into the wind (ten mph). The downwind time was missed. We made three attempts with the full tuned pipe but failed to get the pipe to "come in" and subsequently burned up the engine—when our fuel

cut-off failed to work in flight. Later an engine change-back to ■ Supertigre was in vain—we blew it when both prop blades let go. This airplane made seven official flights and is still around to be used an an engine, radio test bed, (and more record attempts?).

"Conclusion: Failure to break the record at this attempt has further dedicated Cliff and I to overcoming the difficulties associated with it, and perhaps the technology achieved in doing so will benefit the rest of the radio controlled airplane sport."

As speed engine designers and speed aircraft design specialists the authors would be branded extremely selfish if we didn't mention at this point some things that could greatly help any RC pylon racing merchant or potential RC speed participants.

The following articles could conceivably help any RC flier who ever wanted to get just a little more knowledge about squeezing some extra power out of his RC engine. Many of you pylon racers, for example, would be shocked to find out how old some of the new speed secrets really are. Try to dig up some of these: "Close Up on Speed," (April 1962 **American Modeler**); the more recent "No Speed Limit," in the April 1970 *MAN*; "Speed Engine Development in the U.S.A., in the July 1970 *Aeromodeller*, and finally the "Mid-March," 1970 Competition Newsletter (AMA).

Epilog

Just as we submitted this article to AAM, we learned that the Soviets have now captured nearly every FAI world record as a result of a special three-day session held just two weeks after the DCRC trials. Goukon and Myanin claimed 213.7 mph and an RC seaplane speed of 182.6 mph. Bull? Suppose the Russian CL speed merchants set up the engines for the G/M team? Roger Theobold, the T in TWA, had given a TWA to the Russian CL speed men, and Natalenko in particular made an almost exact duplicate and called it the Start. He, however, made the silly mistake of using a drum type induction system—long ago tried and abandoned by our CL speed merchants—and at the last FAI CL speed championships the Russians came in sixth, eighth and seventeenth.

Our guys took first, second and fifth with the third place taken by Brian Jackson using an American designed plane and engine.

However, in the 1968 CL FAI speed championships the Russians using the Start were only about ten mph behind the Americans, and therefore, the 213.7 and 182.6 could possibly be true.

AMA News Bits

(Continued from page 109)

Delta Dart = Improved PR

Delta Dart programs continue to serve many purposes: promoting model aviation, providing youngsters with a fun and worthwhile activity, and creating better public relations for model clubs.

For example, the AMA chartered Nor'Westers (Portland, Oregon) and the Oregon Museum of Science and Industry (OMSI) conducted a Delta Dart program with joint sponsorship. We hear that, since then, the club has been holding meetings in a room offered by OMSI. A nice feature of the OMSI facilities is club members may be allowed to fly Indoor models there.

License Check a Must

Everyone who flies at the AMA chartered Saginaw Valley RC Club (Mich.) field must have AMA and FCC Licenses and also be a member of the club or an invited guest of a club member. That's the way it should be for everyone's protection. Making sure that all flyers conform with these requirements is fairly simple, according to a report in the SVRCC Newsletter, if each member does his part. If someone is flying who the SVRCC member doesn't know or doesn't know to be in compliance with the requirements, the member should ask to see the unknown flyer's licenses and ask whose guest he is: if the unknown flyer doesn't meet the requirements, letting him know the facts usually will adequately handle the situation.

Contest Packing

Frank Schwartz (AMA 123), editor of Glow Plug, newsletter of the AMA chartered Middle Tennessee RC Society (Nashville), feels there is a right and wrong way to pack to go to a contest.

He writes: "Assuming you have a truck or station wagon, be sure to put the tent and field box forward. If you stop suddenly (the tent and field box were in the back) they might slide into the plane. Use hanging racks to hang the wings. Securely place the fuel and also deck chairs. Coming home: throw the broken wings and destroyed fuselages in, dump the tent in (you can fold it up later), chuck in the field boxes and take off for home. . .next year will be better."

Mylar

(continued from page 54)

now solve that problem before it starts. Use your rib template and cut two sliced ribs from 1/8, 3/16, or ¼ sheet to fit the top camber. Fit and cement these slices next to the tip dihedral rib on the inboard side. You'll have to cut them at the spars. You now have a thicker rib on top at the tip dihedral break and something extra for the outboard panels to contact to.

We've been using a new clear liquid contact cement for jobs such as this called Permabond. It has the consistency of water and if you have a section fitted such as the sliced ribs, place one drop on the crack and it penetrates and hardens in three seconds. Sure saves time! Any excess on the surface just sets there so wipe it off with a piece of tissue. If you get it between your fingers, get the razor blade out and prepare for surgery! This material is very similar to Eastman 910. It doesn't warp structure (I build indoor jobs with it) and works great on plywood/balsa or balsa/balsa lamination as well.

Now to cover the outboard sections: Lay a piece of paper with a slot cut in it over the mylar, balsa tip dihedral break and spray contact that area. Set the wing down on the rest of your painted mylar, and cut the outboard panels, allowing for overlap at the inboard dihedral breaks and also for the center panel to overlap those breaks by at least 3/16" past the ribs. Set the outboard panels in place, paint side down, touch iron same as tips, to center of outboard dihedral rib and inboard dihedral rib and at the LE and TE both ribs. To contact the overlap along LE and TE, lay a card on the bottom of the wing near overlap and spray lightly. Let dry and trim to ¼". Complete seal same as tips. No balsa fill is needed here since the angle is shallow. Use the same piece of slotted paper to spray contact the mylar over the inboard dihedral rib. Fit the center section and seal.

It sure took a lot more time to write this than it has to cover the wing. Pin

hole the rest of the sealed bays in the outboard and center sections and start shrinking from the tips in. Do a bay on the bottom and the same on the top and keep moving in. Any excess spray may be cleaned away with turpentine or auto enamel reducer or lacquer thinner—just a few drops on a cloth. 3M also makes a ½" chrome mylar self-sealing tape that looks great on the leading edge and flashes well in the sun. When your ship is out of sight the flash can still be seen and can give you extra time on the watch.

By the way, if you twisted a warp in or would like to put some wash-in or wash-out into a surface, just heat up the iron, secure the surface at the position you like and pass the iron over and under again—that will set it. I usually leave a wing or stab on the ship to do this, then I don't have to hold the center.

Right about now, you may be wondering how the lettering, stars and bars were done on the Satellite 500 A Special. It takes an artist like Walt Prey, President of the San Valeers, to do free-hand and few have his talent, including me. So, here's the easy way an "all thumbs" type does it:

Cut sections of poster board that exactly fit the spanwise length of all panels. Leave the chord of these pieces about an inch wider than both the leading edge and trailing edge. Set the bare framework down on the poster board and draw an outline with a ballpoint pen. Tape the poster board sections together with 3/4" or 1" masking tape across the chord leaving each section about ½" apart from the other. It doesn't hurt to mark the dihedral breaks also. With a straight edge draw in the center spar, spanwise, or any straight register line. Doodle in your lettering and design ideas with a soft pencil. When you've arrived at something you like, use angles, straightedges and curves to solidify your idea with a ballpoint pen. Tape the poster board down.

Get out the No. 11 blade and X-acto knife and cut all those neat designs you've figured out. Be sure they are free and cut clean, but don't lift them out yet. Write on each cut piece, what it is and where it goes (the center of the second A in AMA, for example). At this point I use five plastic bags—one for each panel and put the cut out parts from each panel in a separate bag. Never did care for jigsaw puzzles! Wow look at that stencil! Sure did get carried away, didn't you?

Let's paint. Secure your clear mylar to the bench as described earlier. You probably won't be doing letters on the bottom of the wing so cover that section of mylar with taped paper for now. Turn the stencil over, end for end, so the letters are reversed. Place the stencil over the clear mylar. Mylar doesn't show pin holes and they won't cause rips, so pin the stencil to the mylar at various spots near cut out portions of the stencil. This holds it down in that area and when you spray through the cutouts, a clean line results.

How about doing the letters first? Look in the plastic bags and get the cen-

ters of As, Ps, Bs, etc. and pin them in place. Cover all other stars, stripes, moons, and whatever you don't want painted or fit the cut out pieces in. Fitting is easy since they are all identified. I used black letters with gold edging later. Spray the letters with whatever color you've decided. Do it lightly and then again. Let dry. Replace the cut out and spray blue, then replace them. Spray the stripes and replace. To get the gold shading on the black letters, pull all the pins out of the stencil, move it down toward the TE about 1/8" in with the letters out, so you can see through, pin around the letters, and lightly spray Kandy Color gold base.

As soon as this is dry, remove the stencil and look at the results. A whole gang of letters, stars, strips, and bars over clear mylar! Are they all sharp? If any edges are too fuzzy or have bled, don't despair. Use a very fine brush and little lacquer thinner and clean it, then dry with a kleenex. This won't affect the mylar at all. In fact, if you don't like the job, soak a rag in thinner and wipe it all off, and do it over. Painting only takes a few minutes anyway.

We always use the lightest color for the main color because it can be sprayed lightly and look great. In the case of the Satellite "500" A Special, the main color is Kandy Color Lime Gold. Whatever color you choose, remove the paper shield from the other section of your taped down mylar at this time, if you want the top and bottom to be the same color, and go ahead and spray the entire piece. You might want to pin stars back in place since lime gold, for instance, could turn blue stars green.

Covering and heat shrinking involves the same process as earlier described. Just remember what you registered your design from, such as the center spar, and lay it up that way. Be certain to allow for all overlaps when you cut the separate panels. You can turn the mylar paint side down and put the stencil under it, and your previously marked points for dihedral breaks will show through. This will assist in making your cuts. It's a good time to put all of the pieces back in the bags and hang up your stencil someplace. It will come in handy if you want to do a T-shirt or another wing in a different color just to show what kind of artist you really are.

Mylar is very tough, but all models get rips, tears, snags and holes eventually. If you are at a contest and the covering is damaged, it can easily be repaired on the field with scotch tape and later the section can be replaced with mylar painted the same as the rest of the surface (contact the edge of the repair to seal). I've had a pound of bacon go through the top of my wing tip from the refrigerator in my trailer and in this case I used MonoKote "trim film" over the huge hole and went ahead to win the San Valeers Annual in Class C.

To keep your surfaces gleaming like new, clean with a soft cloth and DuPont Enamel Reducer (small amount) and dry with another soft cloth.

Refer to the following for size, use, price and ordering information: ¼ mil (.00025), Penny Plane, ½A, Coupe, light

Sport Gas and Rubber, 50 sq. ft. at $5.00; ½ mil (.0005), ½A, A, Wake, Unlimited Rubber, (½A, A Sport UC), 50 sq. ft. at $7.50; 1 mil, B, C, D Gas, Sport and Combat UC, 50 sq. ft. at $10.00. To order, include fifty cents postage. Send checks or money orders to: Bill Hunter, Satellite City, 9486 Sandusky St., Arleta, Calif. 91331.

Sources of other materials: "Kandy Apple" Lacquer and DuPont Enamel Reducer—Auto Supply Stores; 3M 77 Spray Contact Cement and 3M Chrome Tape—Hobby and Craft Shops, Auto Supply Stores, or call nearest 3M representative; Sealector Sealing Iron (may use household iron—Hobby Shops, or Seal Inc., Derby, Connecticut; Permabond Contact Cement—Satellite City; Poster Board—Art Supply, Stationers, Drug Stores; K&B Mfg. Super Poxy 30—Hobby Shops. Other films available at Hobby Shops for covering models include Citizenship's Silictac and Top Flite's Super Monokote.

Loughead

(continued from page 47)

The upper wing, built in three sections (seven-gallon gas tank located in the center section), was held in place by latches. A V strut, supporting both wings, was solidly bolted to the upper wing spar and fastened to the lower wing spar by a rigid pivot pin connection. On the ground, both wings folded alongside the tapered fuselage to cutouts in the horizontal stab.

All this and a brand-new, untried, untested, 25 hp, two-cylinder opposed, water-cooled engine too! In fact, there was so much new about the airplane, Bud gave things more than his customary thorough going-over. To his amazement, and for the first time in his experience, nothing required re-engineering. A test site and date were picked.

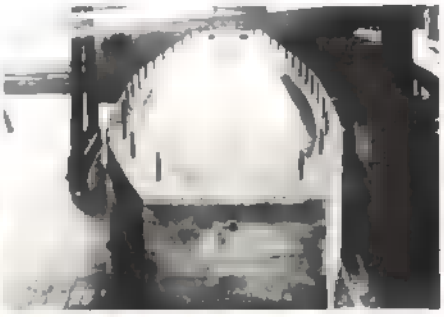
As Bud settled into the cockpit on the afternoon of April 11, 1920, a pair of eager hands laid onto the S-1's 5-1/2 foot Jacuzzi prop and pulled it through. The little experimental engine whirred to life. While her anxious builders watched, the plane rose cautiously from the ground. Then, almost imperceptibly easing off at a couple hundred feet, Bud made a solicitous and gentlemanly "pass" at his controls—especially roll. Surprise! She responded.

With a new measure of confidence, Bud then climbed to 1000 ft. and leveled off. Because of the newness of the engine, he didn't want to open her up full bore. Nor, since longevity is undeniably linked with discretion, did he care to wander too far from a suitable landing spot.

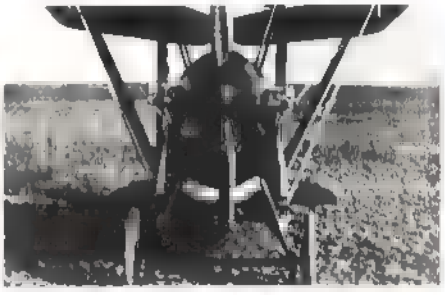
After a couple lazy 180s over the field, Bud decided to test out her landing characteristics and the effectiveness of the air brake wing. Making a long, low, slow-in approach, he cut throttle, and "she squatted like a duck" before he could release the air brake lever.

He taxied over to the happy onlookers to check out what further testing they wanted done. Shouting over the idling engine he said he'd noticed that engine compression seemed a bit low and he wanted to go back up to see if he could "kick it up a little."

"No. It flies!" Allan grinned. "We'll finish testing later. Right now, let's get



Concrete molds from which S-1 monocoque fuselage emerged. To achieve the desired "ply," three layers of wood, interspersed with two layers of binding cloth, all liberally slopped with Casein glue, were held under 20 psi until glue was dry.



"Although there are traces of the well-known German Albatros, everything about this little aeroplane denotes a refinement and finish of the best French and English machines, and lacking in most American craft." (Flight: August, 1920)

'er dressed off and up to San Francisco."

A few days later, all gussied up and shiney, the S-1 attracted favorable attention at the air show. Besides enticing potential investors in the struggling company, there was a definite sale contingent on a flight demo. After the show closed, Bud was called up to Redwood City, just ■ few miles south of San Francisco. Here they continued test work and attempted to improve engine compression.

But a disconcerting chain of events was already in motion, including the government's dumping of surplus aircraft on an already strained aviation economy. No individual buyer was interested in a $2500 airplane when he could get a brand new, in-the-crate Jenny for less than a quarter of that amount. And attempts to jack up lagging horsepower in the Loughead engine, as Bud would say later "were superfluous."

In our interviews, Bud staunchly maintained that all the ideas incorporated into the S-1 were sound. As far as the engine was concerned, it wasn't a lack of dependability but just a frustrating lack of "oomph." Today, Jack or Tony would dearly love to disassociate all kinship with that engine. But the fact remains, within the unitary function of the team—then and later—well, neither one of 'em should take any blood tests.

So the S-1 became ■ one-of-a-kind, and one more company went belly up. Yet, if that were the entire story, the whole thing would be a bore. Something was created that wouldn't die or disappear: During the 20s an aeronautical incubation was developing into ■ new era. Soon there was the necessary financial as well as experimental and technological progress. The air was supercharged with engineers, constructors, aviators and mechs moving around in an exciting stream of growth and discovery. Within this whirlpool, Allan, Jack, and Tony would get it all together again.

It was the possibilities inherent in the basic idea that led to an improved and updated S-1, the Lockheed Vega. And there's one helluva success!

With basic Loughead engineering and construction methods, the influence of the Lockheed Vega was far flung and imitated. The influence of the Vega in both Douglas and Consolidated aircraft of the period is undeniable.

And, although the old Loughead Co. eventually changed hands (and spelling), the foundation and the initial attraction was there. Begun by Allan, Tony, and Jack, this attraction subsequently drew the aeronautical young "comers" to follow Jack Northrop, Gerry Vultee, Larry Bell, George Prudden, Kelly Johnson and others to develop and spread their influence throughout today's aircraft industry.

S-1 a flop? Not a bit.

Loughead (1920) Personnel Interviewed: Anthony Stadlman, Shop Superintendent; John K. Northrop, Engineer;

Gilbert George Budwig, Test Pilot; Norman S. Hall, Public Relations; Arthur P. Church, President; Carl C. Christofferson, Mechanic and shop man; Special thanks to the sons of Allan H. Lockheed—John and Allan, Jr.

Specifications[1]: Loughead Model S-1

General Dimensions:
Length—20'
Height—7' 11"
Wingspan (upper)—28'
Wingspan (lower)—24'
Width of machine folded—10'
Wing Chord-upper panel—4' 9"
Wing Chord-lower panel—2' 6"

Weights:
Total Weight (full load)—650 lb.
Net Weight—400 lb.
Useful Load—250 lb.

Performance:
Maximum Speed (sea Level)—75 mph
Minimum Speed (sea level)—28 mph
Landing Speed—25 mph
Rate of Climb (from sea level)—700 ft./min.
Ceiling—16,000'
Gliding Angle—11 to 1

Endurance at sea level:
At high speed (miles)—225
At high speed (hours)—3
At economical speed—400 mi.
At economical speed—7 hrs.

Details:
Controls: Stick for elevator and original patented[2] lateral control. Footbar for rudder.
Standard equipment: Tachometer, altimeter, water thermometer, oil pressure gauge, gasolene (sic) gauge. Complete set of tools. Other equipment on special order.
Fuel tank: Seven gal. Gravity tank located in the center section of upper wing with gauge in view.
Tailskid: Independent, fastened to the body with shock absorber cord only.
Standard Finish: Fusitage (sic) maroon, Wings cream color. Special finishing work done to order.
All wires, cables, bolts and other metal parts are thoroughly rust proofed by our own process.

[1]Found in Bill Rust's personal file, these up-dated specs were copied from a typewritten list pasted on top of those printed in the original Loughead brochure. (Performance numbers are estimates.)
[2]While the Loughead brothers, Northrop and Stadlman drew up a business contract governing all aircraft patents and designs, except for the monocoque process, nothing else was ever patented.

Quasimodo

(continued from page 48)

When I took it out for its test flight, which proved to be a little hairy, I found out the hard way that aileron movement on a ship this size must be quite restricted. Moving the aileron links up on the control horns cured this and later flights showed that the ship was fast, as well as fully aerobatic and a great deal of fun to fly. At 3¼ lb. with a good 35, it's about two-thirds demon. With careful wood selection and a lighter radio, a 19 should fly it nicely. My friends still insist it isn't a potential beauty contest winner but I prefer to believe that, as proven by Volkswagen, functional design is beautiful design.

So, if you're interested in Quasimodo, start with the sheet parts.

Construction

Construction is reasonably conventional, so I'll just describe the more important details. You'll see that the plans show some minor differences from the ship shown in the photos but nothing serious. Start by cutting tail group parts, ailerons and canopy sides from four sheets of 3/16 x 3 x 36" balsa. The stab is glued up from sheet cut crosswise; drops are used for the stab tips, dorsal and wing ribs.

Build the wing next. A jig is a big help here, since the wing ribs have no straight lines to rest on a building board. Don't omit the spar webs which add greatly to the general strength of the wing and, most important, be sure to reinforce the wing's center section with fiberglass, since spar braces aren't used. Aileron horns are bent up from 3/32" music wire and bearings are made from 1/8" brass tubing. Tip plates are added after the wing is covered but before it's doped.

The fuselage is built upside down over the plans. Engine and tank compartments should be fuelproofed with epoxy resin or Hobbypoxy. The wing seal is made by taping Saran Wrap to the bottom of the wing, squeezing a bead of

Silastic onto the wing saddle and rubber-banding the wing lightly in place. The canopy is assembled with the wing in place, using cut-and-try for a good fit. On the model shown, aileron pushrod exits are 1/4" dia. holes and the aileron linkage must be disconnected to remove the canopy. If this seems inconvenient, cut slots instead. Fuel-proof the inside of the front half of the canopy with epoxy.

Bend the landing gear parts from 5/32" music wire, wrap with bare copper wire and solder. The landing gear fastens to its mount plate with Top Flite landing gear clips. Tail-wheel strut is bent from 1/16" music wire and coupled to the rudder with a U-shaped clip of aluminum or tin-can metal.

Cover and finish as you desire. The model shown was covered entirely with Silkspan dyed with Rit and given five coats of Aero Gloss clear. Use color dope or MonoKote for trim if you like, but don't build up a multi-coat color finish which can add enough weight to affect the performance of a ship this size seriously. The wing may be covered with silk if desired but I advise against mylar, which has great puncture resistance but doesn't add the strength of ■ dope-shrunk covering.

Radio installation is up to you. The general installation shown for my Heathkit will work for most radios. A smaller radio would be easier to install, but the Heathkit is a very reliable rig and I highly recommend it. I used old-fashioned Figure-8 braided nylon fish-line hinges throughout; you can be more up-to-date and use plastic hinges on the tail surfaces if you like, but you'll have to stick to thread or fabric for aileron hinges unless you add hinge blocks to the wing trailing edge during construction. Glue the fuel tank in with Silastic, which holds tightly but permits easy removal if necessary.

Flying

Before the test flight, check for warps and misalignments. Be sure the aileron movement isn't excessive—the linkage shown in the plans will produce close to the right amount for a Kraft or Heath servo with the pushrods in the outer holes of the rotary output arm. Check the CG position carefully. It shouldn't be aft of the center of the main spar, though it may be somewhat forward of it. Line up as closely ■ possible upwind and open the throttle slowly. Hold full up elevator for the first few feet of the takeoff run until there is enough airspeed to make the rudder effective. A little back pressure will lift it off easily, and then it's all yours.

You will find Quasimodo particularly good in snapping and spinning—a power-on spin from high attitude is particularly spectacular. Horizontal rolls and inverted flight are also good. Landings ■■ good for ■ tail-dragger, though I prefer wheel landings to full-stall three point landings. With practice, you may wish (as I did) to increase aileron throw a little.

About the only place small engines and planes are at ■ distinct disadvantage to large ships is in vertical rolling

maneuvers which call for brute power. A faster roll rate will allow victory rolls and top hats, but start the roll quickly and keep the straight flight short. Quasimodo's only bad habit is poor tracking in high-angle entry to inverted spins—possibly due to a burbling effect from the canopy. This can be minimized by generous application of rudder and low angle entries.

Finally, remember Quasimodo is small, fast and has quick response, particularly about the roll axis. Keep ahead of it, or it can quickly get far enough away to make it difficult to determine its attitude. For this reason, it definitely is not a good trainer. It might be modified with an extra four degrees of dihedral per panel and powered with a 19 for the beginner.

Oh, yes, the name. Quasimodo was the Hunchback of Notre Dame—small and ugly, but agile, very agile.

BILL OF MATERIALS

Balsa: all balsa contest grade
1 1 x 3 x 3"
1 1/4 x 3 x 36"
4 3/16 x 3 x 36"
5 1/8 x 3 x 36"
2 3/32 x 3 x 36"
3 3/32 x 2 x 36"

Hardwood:
2 1/2 x 3/8 x 12" maple motor mount stock
2 3/16" sq. x 48" spruce
3 1/8" sq. x 48" spruce
1 1/4 x 36" dowel
1 3/16 x 36" dowel
1 3 x 3 x 1/8" plywood
1 1 x 4 x 1/16" plywood

Hardware and miscellaneous:
1 5/32 x 36"
1 1/16 x 36" music wire
1 pkg. Top Flite landing gear clips
1 tail wheel bracket
1 set 5/32" ID wheel collars
bare wire, solder
1 4-40 x 1" engine mounting bolts with blind nuts
1 1/4" spinner
1 6 oz. fuel tank, Sullivan RST-6 preferred
1 pr. 2 1/2" wheels
1 1" wheel
1 pc. fiberglass tape, 4 x 18"
adhesives: Titebond, Hobbypoxy Formula I, epoxy resin, Silastic
1 bicycle spoke
3 sheets heavy Silkspan
Aero Gloss clear dope, color dope as desired
1 1/8 x 12" brass tubing
1 set aileron links
4 Kwik-Links
1 Ny-link
3 pushrod exit guides
3 pushrod keepers
2 control horns
hinges or braided nylon fishline

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October, 1972

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Editor:
Carl Wheeley

MODEL AVIATION

Official magazine

A.M.A. NEWS

Academy of Model Aeronautics ■ 806 Fifteenth Street N.W., Washington, DC 20005

Education in Aeromodeling

One of the most effective ways of promoting the use of model airplanes is through a personal learning experience. Unfortunately however, there are few places where one can seek this form of training in the aeromodeling field. Once a member of a family is introduced to model flying and building, the enthusiasm and love for the sport is usually conveyed to the other members of the family—thus new people are introduced to aeromodeling. But what about all the others who have never seen or heard about this sport? How may they be introduced to it? When will they share in the experience?

One way, perhaps the most frequent one, is by happenstance when a person out for a Sunday drive observes a group of model flyers in action. He likes what he sees and stops to chat with one of the flyers to find out more about the activity—what it costs, where to get supplies, how long it takes to build, etc. A few more trips to the flying field, and our newcomer is hitting it off real well with the flyers, is invited to join the local club, and perhaps winds up under the personal tutelage of one of the club members.

Another way is through the now famous Delta Dart Program sponsored by the AMA and the Hobby Industry Association of America. This involves AMA chartered clubs and youngsters age 8-13 in the construction and flying of the easy to build and fly rubber-powered Delta Dart designed by AMA Technical Director Frank Ehling. Nearly 100,000 Delta Dart kits have already been distributed in this program.

Fairly new on the scene, but seemingly growing in momentum, is classroom instruction for model airplanes—some as part of other courses, but others solely concerning modeling. Cited below are several examples of recently concluded and/or continuing classes for model aircraft building and flying.

Promoting model aviation through education ■ been a successful project for concerned modelers from various parts of the country who have utilized the classroom to accomplish this. Shown here is ■ such man, Robert Graham, instructing his class of eager students at Platteville High School, Wisconsin, in the building and flying of model airplanes.

Although the AMA-HIAA Delta Dart Program is not set up in a classroom situation, Jack Smith (AMA 33249) found the Delta Dart model itself to be an excellent teaching aid while dealing with his class of low academic success students (either due to low ability or lack of motivation) at Middletown, (Conn.) High School, by setting up his own program using these models. "Needless to say," wrote Smith, "after nine years of near failure in school, it isn't very often that something gets these kids involved. Last year I bought some of the Delta Dart kits more out of frustration that anything else and passed them out to each kid. The results were quite satisfying, and a number of the students showed in their attention to detail a degree of concentration that I hadn't seen before."

Smith's conclusions about the Delta Dart's success with this kind of student were this:

"The end product belonged to the student; the time between the start of the project and completion was short [approximately 1½ to 2 hours with adult instruction, including drying time]; the physical principles of the project were demonstrated in a real way [flying the Delta Darts in the school auditorium after completing the construction of the model]; the test of the project gives a sense of reward—it flies!"

"The trouble," he continued, "is that all the projects must be carefully planned, give almost guaranteed success, include individual and simple instruction sheets and probably have all materials in individual kit form since these kids work at different speeds." Smith's Delta Dart classroom project fit these requirements; the teacher and the students were rewarded with a real sense of accomplishment.

Jack Netland, head of the science department at Northview Junior High School (Brooklyn Park, Minn.) was aware of the fantastic educational potentials of an aeromodeling course. Because of this, he provided his students with an exceptional learning experience within the framework of model (particularly Control Line 1/2A planes) building and flying sessions during school time. In order to make this program a success, Netland contacted Pete Simonson, president of the local Control Line model airplane club, the AMA chartered Minneapolis Piston Poppers, and told him of his plans. Soon after, Simonson was instructing a class of 40 eager kids, on a weekly basis, about the basics of model building and flying, keeping in mind their goal—to have a model plane contest between two local schools.

Netland related the success and enthusiasm of the program and added "It is quite rewarding to the individual involved, and also serves as an excellent connection be-

Above: Pete Simonson explains CL Stunt maneuvers to North View J.H.S. (Minn.) students. Below: Instructor Robert Graham (Platteville, Wisc.) combines contest prizes with homework ■ ■ presents Roger ihm with a small rubber model to ■ completed for ■e next meeting.

Flying sessions in Father-Son aeromodeling classes. Above: Howard Bueschel (Pennington, N.J.) assisting ■■ student with ½A FF model. Below: Robert Graham's class competing in a H.L. Glider contest.

tween school and community. . .I would hope other modelers could find the time to share their hobby with them [the kids]."

Robert Graham (AMA 19846), a member of the Platteville (Wisc.) school board and publisher of a three-county shopping guide, has been working with a similar project, but in evening hours and open to adults as well as youngsters. It was required that those under 16 be accompanied by an adult.

As a result of adverse oppositon by members of the community to the noise and safety factors involved, Graham—a modeler of more than 20 years—recognized the opposition as a misunderstanding as far as model airplane activity is concerned and, therefore, felt that it was his duty to correctly represent aeromodeling.

In an open letter to one community leader who opposed the operation of model airplanes, which was published in Graham's column in his Shopping News, Graham set the record straight. He first explained what modeling means to him. Then he continued to explain what modeling could mean to the community. In the same letter Graham wrote, "It would be my hope that if any citizen went to the school board and offered leadership in any kind of wholesome activity that would cause youngsters and adults to create, to accept challenges and aspire to accomplishment, that the board would grant use of school facilities. . .I do know of cases of youngsters being told they can't run their airplane engines because 'it is against the law'. So how can a ten year old cope with that? He needs the concern of an adult. . .Sometimes we hear the question, 'What is there for young people to do?' Isn't an activity that adds another common bond between parent and son or daughter worth a little annoyance?"

Students of the Chosen Valley Elementary School (Chatfield, Minnesota) ■■ shown here constructing their Delta Dart models during their science class as part of the AMA Delta Dart program for schools. W. B. Thomas, Principal, wrote AMA HQ of the success of the project: "The children enjoyed ■■ building and flying of the Delta Darts very much and were quite proud ■ their accomplishments."

Schools interested in providing their students with an easy-to-do aeromodeling program are encouraged to write to AMA HQ, 806 Fifteenth St., N.W., Washington, D.C., 20005, for a free classroom quantity (35) of AMA Delta Darts. Requests (on school stationery) should include basic plans for the construction and flying program and the number of students participating. In return, AMA asks that teachers provide information concerning the project, especially how the Delta Darts were used as a vehicle to improve education and educational techniques in ■ areas, not just modeling.

Despite the major barriers that had to be tackled, Graham organized an aeromodeling course open to the local public. The 10 weeks of instruction encompassed all the basics of model building and flying, and active participation in both. Selection of models was the student's choice; Graham anticipated those wanting to build and fly planes as basic as the Delta Dart and also planes as complicated as powered RC.

The class, therefore, was organized in order to provide instruction on all types of modeling to allow the student the freedom of deciding among any number of different planes and price ranges. Effects of trim adjustments, procedures for doping models, and instructions concerning radio and engine installment were only a few of the many areas that Graham's course dealt with. He also included movies to aid in the explanation of various points.

The individual efforts of Smith, Netland, and Graham will long be remembered by participants in their programs. However, these three different approaches to using aeromodeling in an educational framework are not the only ways.

On a much broader scope, courses are available that encourage the students to pass on their aeromodeling knowledge to others (as in a teaching capacity). In these courses, one main purpose is to point out the direct relationship betwen the knowledge of miniature aircraft and the similar science of full size aircraft.

Various schools, having developed an aerospace education program, have utilized simple model airplanes, particularly the Delta Dart. The results of incorporating model airplane activity were quite beneficial.

More specifically, C.H. Robinson, Dean of

A Little Fun with Modeling

PRESIDENT'S MEMO

One of the most important ingredients in airplane modeling HAS TO BE A SENSE OF HUMOR! This sense of humor will pay off in most of your other activities as well. Since I have a well developed sense of humor, and the ability to enjoy laughing at myself and what I occasionally do, I thought you might like sharing a few "ticklers" with me. I offer the following to you as a bunch of "tongue-in-cheek" suggestions.

To preserve a favorable "image" for airplane modeling, don't crash your model planes before witnesses. If you just MUST crash your plane, try to do it neatly! (Directly into a trash can would be thoughtful.)

Don't eat the glue off your fingers in public! You might be mistaken for a cannibal.

If you are ashamed of the workmanship of your model–fly it in the dark!

Don't appear in public with your AMA membership card in one hand and bandages all over your other hand!

When buying modeling supplies–be sure to get enough glue for your hands and pants as well as for your airplane!

Be sure to put down waxed paper before gluing your fingers together!

Be sure not to glue your new model to the workbench unless your engine has an unusual amount of power!

Neatness hint! Glue all of your scraps and trash together into one lump. Then you can throw it all out in one trip! You might even show how thoughtful you are by gluing a handle on it to bring a smile to the face of the trash man.

Be thorough! Count your fingers after cutting out the parts for your model. If any of them are missing, or unusually short, see a doctor as soon as you are through working!

If you happen to have one of the Italian engines, you might try a little garlic in the fuel. In Combat, nothing will come near!

AMA President John Clemens

Economy hint! Ear plugs for your neighbors might be cheaper than a muffler for your engine. And they might love you for it because this would take care of the motorbikes, lawnmowers, chain saws, go-karts, airliners, and heavy trucks as well! (We ain't the only sinners, ya know!)

Further economy hint! I haven't tried it, but since steel wool is cheap, you might try KNITTING a muffler for your engine.

And this CAN be a family hobby! Mother can hold her hands over the kids' ears while dad "talks" to the propeller that just whacked him on the hand!

Modeling can be educational! Probably sometime you will accidentally build two left wings for a monoplane. That will show you what a darn fool feels like. (I know, because I did it once!)

If you are a Control Line flyer, sometime try taking off with your handle upside-down! YOU probably will not enjoy it, but it is a great crowd pleaser!

If you haven't tried golf, and wonder if it is really more fun, hit your airplane with a stick and see if it IS really more fun!

Safety hint! Do not adjust the needle valve on a running engine by reaching through the prop. You probably aren't fast enough!

For the heck of it–ask the cop what he'd rather you do than build and fly model planes. (I'm serious about this!)

There is a rumor that AMA Headquarters usually ignores all letters written to them in crayon. No one there reads "crayon". (That isn't as funny as it sounds. They also DON'T read the letters that you INTENDED to write, but never got around to it!)

All of the above is a lot of "hocum", but heck, your hobby is supposed to be a lot of fun. And I can't think of any hobby that offers more just plain old fun, even if it starts with only a nickel glider.

John E. Clemens
AMA President

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the Herbert H. Lehman College (Bronx, N.Y.) wrote in response to the use of the Delta Dart in the university's aerospace seminar, "Those attending were very favorable in their reactions and found the program a genuine learning experience. The follow-up report indicated that teachers used the simple model airplane approach learned in the seminar in their elementary and junior high classes. In some instances, teachers made aerospace itself the curriculum component, and in other instances it was imaginatively incorporated into other course material. Thus, the impact of the seminar multiplied itself through the teachers to the students."

Another successful program which benefited from the use of model airplanes was the State of Montana Aerospace Education Program. Duane Jackson, Montana's Aviation Education Supervisor wrote to AMA HQ (having supplied them with Delta Darts), "...we are conducting two teacher training programs in Montana. The major goal of these courses is to make the teacher cognizant of the total aerospace field and of the vital importance of this aerospace effort in our contry's development. We believe informed teachers are necessary and appreciate your support of our program."

Another noteworthy contribution to the learning usage of model aviation is Howard A. Bueschel's involvement in aviation education. Bueschel, director of the Aerospace Resources Center (Pennington, N.J.), devotes much of his time to those teachers who have never had the opportunity to acquire professional background knowledge in aerospace education (which he feels is a great majority) by providing them with various aviation/aerospace programs. In these courses designed for the professional educator, Bueschel demonstrates principles with extensive aid of model aircraft.

Jack Netland observing student Jeff Weitzel's technique while covering his "Spad" at a North View J.H.S. (Brooklyn Park, Minn.) class.

In addition to his professional education programs, Bueschel is involved with numerous school groups and clubs where he has put on thousands of flying demonstrations, frequently using a simple Control Line model, the Beginner's Ringmaster. Also, he has conducted a "Father-Son Model Aeronautics Course" in which he provides professional instruction, modern training aids, outdoor flying sessions, and uses Scale, Free Flight and Control Line models as well as aviation movies. These techniques aim to furnish the class with a broad knowledge of aviation via the impact of personal participation in the building, flying, and viewing of model planes.

Similar to the other programs, Bueschel's depends on the basics of aeromodeling to add excitement and believability to the learning experience.

Hopefully the reporting of these successful educational programs will serve as an example to those who are interested in sharing their personal modeling experiences and knowledge.

NEWS bits

Feels Wanted in Club

What does a youngster get from association with a model club primarily of adults? Maybe only a little, but there is potential for much. How does one 11-year-old feel about it? Read what Tony Latini III (AMA 89685) wrote for the newsletter of the AMA chartered Weak-End Aero Modelers in Pennsylvania.

"If anyone asks me why I get to up-tight about being a member of the Weak-End Aero Modelers the answer would be very simple. What other type of club allows an eleven-year-old to be on equal terms as a thirty or fourty-year-old man? What other sport allows me to compete against older fellows where only flying skill and not strength, passing, kicking, or hitting are involved? Where else would I get equal flying time at the flying field, or be allowed to vote on club matters without being pushed off to the sidelines like a child? When I'm at the field, I feel I'm a part of the club. I help rope off the field, hold airplanes ready for takeoff, help cut the grass; and everyone works together and helps me, not because I'm a kid, but because I'm a member. Thanks fellows, and someday I hope I can help one of your boys and make him feel wanted, just as I feel now."

RC/WC Airplanes

Ton Schoonbrood of The Netherlands (Holland) sent us copies of the charts he compiled which show what size and weight airplanes were the most popular at the RC Aerobatic World Championships at Doylestown last September. The charts are a surprise in one respect; one might think that the winners have all settled into just one design niche, but this wasn't so.

In total model weight the bracket having the most models, but no top winners, was 7 to 7½ lbs. Very few were lighter than this. The winners came from higher weight brackets: 7½ to ▮ lbs, 1st and 2nd (Giezendanner and Matt); 8 to 8½ lbs, 3rd (Kraft); 8½ to 9 lbs, 4th (Prettner); 9 to 9½ lbs, 5th (Wester).

Most of the wingspans were concentrated in the range of 60 to 66 inches with a fair number on the shorter side and very few longer. The winner had a 66" span while the runners-up had spans of 61 and 60 inches.

Wing areas were even more wide ranging, from the extremes of 3.7 sq. ft. to 6.1 sq. ft., though most models were concentrated between 4.2 and 5.0. The winner's model was bigger, 5.5 sq. ft., but runners-up were in the mid range, about 4.6 sq. ft.

Schoonbrood's charting was based upon a small portion of the RC/WC model data published in the September 1971 AMA Competition Newsletter. It is an interesting exercise which seems to reinforce the idea that the size and weight of the model doesn't matter near so much as the piloting skill.

Car Selecting Program

Mel Carver (AMA 5817), editor of Smoke Signals, newsletter of the AMA chartered Meroke RC Club, Inc. (N.Y.), related his car selecting procedure in a recent issue.

"Finally broke down and bought Cynthia (Mel's wife) a new car. Picture this, as my co-pilot (Cynthia) and I enter the new car showroom: very smooth looking salesman says to co-pilot, 'May I help you and that man with you (meaning me)? Is that a wing under his arm?' I answered him saying. . .'there is no other way to buy a car. If this wing fits in the trunk, I then bring in a flight box, fuselage, fuel, starter battery, props, towels and fuel pump. If it all fits, I'm ready to buy the car.' At this moment, co-pilot interjects her thoughts on some minor points, such as what size engine, automatic transmission, price with trade-in, color, etc. and aside to me she says, 'Who is the car for anyway?'. . .

Keep 'Em Flying

A simple trick to keep a crack from getting longer if one gets in your favorite plastic ARF is to drill a 1/16" diameter hole at the end of the crack. According to The Connector, newsletter of the AMA chartered Aeroguidance Society, Inc. (N.Y.), this will reduce the stress concentration enough to prevent further cracking. In addition the newsletter suggests fixing the crack with 3M Super Strength Adhesive.

The newsletter also suggest a simple solution for removing nylon wing bolts in that awkward situation when they break off flush with the maple mounting block. Just heat a small screwdriver and push it into the screw; heat will melt the nylon and provide a slot for backing out the screw.

Observer System for Safety

Safety has always played a vital role in model flying, but up until just recently there seemed to be more talk than action. The AMA chartered Aero Sport RC Club (Highland Park, Ill.) has initiated the kind of action that all should consider.

The club's new safety program bases itself on the observer system, requiring someone at the field to be responsible for spotting full

WUPY Radio reporter Jay Jennings shown interviewing Robert Stamour during U.P. Modelers Meet at Ishpeming, Mich. All media provided coverage. Submitted by Robert Gero.

Woe is he! At least James Medley received the Ding Award for his spectacular (though disastrous) efforts at ▬ Mid-Arkansas RC Society Meet in June. L. Hacker photo.

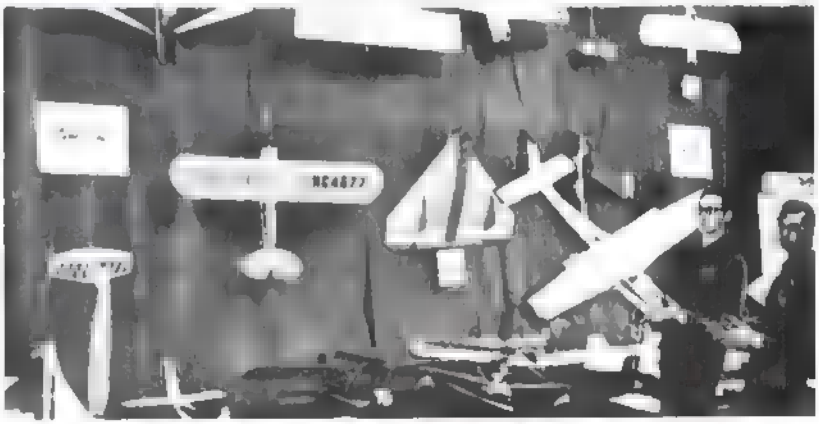
Hand pump sprayer was adapted as a pressure filler by Harley Wadsworth—seen at Tangerine Internationals. Submitted by Ron Moss.

Father-son project is scratch-built Control Line Cessna 414 by Earl and Craig Hidalgo of Morgan City, La. Took six months to build.

Rubber-powered Pilatus Turbo Porter by David Schick, Fraser, Mich. Submitted by Ralph Kaunz.

The promotion arranged by the Salem RC Pilots Assn., Salem, Ore., in conjunction with Lancaster Mall Shopping Center helped change the club's image from "those guys and their toy airplanes" to "a fascinating though technical hobby", according to a report from R. W. Ellison. Pat Holland, in photo above by Ron Cooper of The Oregon Statesman, thrilled viewers of all ages with RC flying demonstrations from parking lot. Photo appeared in Statesman's front page—5 cols. wide! Dave Birch and Dick Chermack, below, helped man the club's display in the enclosed mall.

Control Line semi-scale 1918 Blackburn Kangaroo by Bruce Varley, Houston, has 72" span, two .19's for power, flies well. W. E. Fargsworth photo.



size aircraft and keeping club flyers informed while their RC planes are in flight. All efforts are made to limit altitude and to provide the greatest separation between their models and full size aircraft. These points are in direct alignment with the official AMA Safety Code adopted during the Executive Council's February meeting.

The program was devised following the election of a safety committee consisting of six club members whose responsibility was to create the safety program and to ENFORCE IT.

Watch Those Guesstimates

Noting the report in an earlier AMA News section which credited a 16-year-old with 2,000 hours of RC flying, Jack George (AMA 4126) of Brandon, Fla., suspects that there was either a typographical error or a tremendous guesstimate mistake. Frankly, we don't know for sure whether a mistake was made, as the information came to us second-hand, but from Jack's calculations we suspect that he is right.

Jack feels that high RC flight time estimates are typical from all those who do not keep actual records. He keeps a written record of his flight time and has done so for five years—mainly for battery charging data. His figures show that it is very difficult for even an extremely active flyer to accumulate a huge number of flight hours and with flights of six to ten minutes, it is nearly impossible to keep track of the total time through memory.

Back to the practical side of Jack's record keeping, his experience indicates that frequent, unnecessary charging shortens battery life. He has never had a battery failure, which he admits indicates an element of luck; he attributes his success to keeping records of charging and battery use.

Lone Flyer Nearly Loses Field

Irresponsible flying is an obvious problem which needs to be dealt with on a serious level. Ed Fronczek (AMA 22960), secretary of the AMA chartered Sky-Scrapers (Brooklyn, N.Y.) and AMA District II Free Flight Contest Board member, recently related one such incident. (Fortunately the AMA file of reports of this kind is very thin.) We are printing portions of his letter below in order to warn others of the potential harm of just one irresponsible act.

". . .Some lone RC flyer buzzed one of the Army's helicopters while it was on a jump exercise. . .the modeler in question was not one of our regular FAI FF flyers. . . .we will do everything in our power to try and find the bloke so as to tell him to stop his nonsense. . . . Once we find his AMA number, if any, then we can locate him and give him a blast. If we can't get his number or if he does not belong to AMA then we have a greater problem. If he does not belong to AMA then we will contact people in the area to find him. I don't think we will ask him to join AMA; he's brainless."

One thoughtless modeler can jeopardize all—be considerate and FLY SAFELY!

No Axes to Grind

The newsletter of the AMA chartered Woodland Aero Modelers (Ill.) proudly proclaims that the club is "The only true general interest club in the midwest. We fly FF, RC, CL. We fly indoors and out. We participate in all types of contests, AND we fly for the sheer JOY of flying."

(Continued on page 91)

National Record Reviews

A REPORT OF SELECTED RECENT RECORD HOLDERS HIGHLIGHTING THE DESIGNS AND EQUIPMENT USED.

FF Class B Gas national AMA record, category I, Open age class: 24 minutes, 4 seconds, established by William J. Hunter (AMA 52203), Panorama City, Calif., on January 22, 1972.

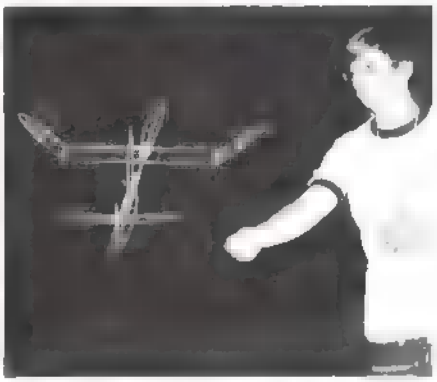
The model is the "Satellite 600" of the flyer's own design. This has a wing of 65" span and 11" center chord, stabilizer of 38" span and 9" center chord. Airfoil of both surfaces is 9% flat bottom. Satellite City 1 mil mylar was used for wing/stab covering, and the fuselage was finished with K & B Super Poxy. The flight surfaces feature semi-geodetic construction to eliminate flutter under power. The airplane weighs 27 ounces.

A Tatone 40 long mount secured the K & B Torpedo .29 RR engine to the aircraft. Satellite City 40% nitro Climb Max fuel was carried in a pacifier pressure tank, and the engine was shut off by a Tatone timer and flood-off system. Satellite City fuse actuated the dethermalizer.

CL Class I Navy Carrier national AMA record, Junior age class: 471.39 points, established by Dale R. Johnson (AMA 32505), Berkeley, Mo., on August 15, 1971.

Dale's 30" wingspan Guardian was designed by Bill Netzeband and published in American Aircraft Modeler. It weighs 34 ounces and is powered by a K & B .40 rear rotor engine and hand-carved 8"D x 8"P left-hand prop. (The posed picture is with a standard prop in place.) A special rotor was built for reverse rotation, and the backplate was turned to a new location. Firing the T.D. Racing Fuel was a Fireball regular glow plug. The engine was pressurized, speed varied by means of a Custom Bill Johnson throttle in conjunction with a J. Roberts bellcrank, customized, and J. Roberts handle. The airplane was finished with Aero Gloss dope. During the record flight, speeds of 89.86 m.p.h. (high) and 29.35 m.p.h. (low) were achieved.

Indoor FAI Stick national AMA record, AMA ceiling category II, Senior age class: 24 minutes, 13 seconds, established by Tom Sova (AMA 75424), Youngstown, Ohio, August 29, 1971.



The photograph illustrates the substantial offset wing mounting and stabilizer tilt employed for this original design. The wing has a span of 26.5" (flat) and chord of 5.4"; it is mounted on 3" posts above the 23.5" fuselage (of which 13.5" comprises the motor stick). The stabilizer is 13.5" by 4", and the prop diameter and pitch are 16" and 30". Power source of the .0365 oz. aircraft was two 17" strands of .053" Pirelli lubed with glycerine and green soap. Covering was with Aerolite microfilm. The construction balsa and thrust bearing were from Micro-X.

Indoor H.L. Glider national AMA record, ceiling category II, Senior age class: 2 minutes, 7.2 seconds, established by Marty Thompson (AMA 26406), Livermore, Calif., on July 26, 1971.

Marty's glider, the "Sweepette 18 Mk 13" published in Model Airplane News, was modified on the spot between the 7th and 8th flights, a fact believed by Marty to be responsible for establishing the record at this high mark. The record was set during regular competition flying at the 1971 Nationals.

In earlier official and test flying, the best single flight time Marty had achieved was 1:01, a good performance but not quite enough to win. The modification was to sand .02" undercamber into what previously was a

diamond shape airfoil. With the undercamber added, the last two flights were 1:03 and 1:04.2, resulting in the top Nats time for all age classes and also the record.

The Sweepette has a wing of 18" span and 4" center chord, stabilizer of 6" span and 2" center chord (and also anhedral), and overall fuselage length of 19". The 15.2-gram plane was constructed from 4-5 lb. Sig. balsa. Photo by Bob Meuser.

FF Class ½A Gas national AMA record, category II, Open age class: 14 minutes, 45 seconds, established by John Kamla (AMA 76130), Bellevue, Wash., on March 12, 1972.

John's airplane is the "Starduster 350" built from a Competition Models kit and powered by a Cox T.D. .049 engine swinging a Cox grey prop of 6"D x 3"P (cut to 5-13/16" diameter) and burning Sig Racing Fuel. The 52" wingspan model was covered with Sig Jap tissue and finished with Aero Gloss dope and fuel proofer. With a judicious use of cement and dope, the airplane weighed in at 7.5 ounces.

The engine was positioned upright onto a CM-1 tank mount. Engine run timing was with a Tatone ½A Tick-Off timer; dethermalizer timing and actuating was with Sig fuse.

AMA News Extra .....

WERWAGE REPEATS AS CL STUNT WORLD CHAMPION

"He got his fuel!" That was the first thought of many in AMA HQ when the RCA Global Telegram was received from Team Manager Doc Jackson indicating that Bill Werwage of Berea, Ohio, had won the FAI Control Line Aerobatics Individual World Champion title for the second time in a row.

The reason why this thought was so much on the minds of the HQ people was that, in the middle of the week before the July 14-16 contest began, there had been an urgent telephone call from Mrs. Werwage who passed on word from Bill that the fuel he had been able to obtain in Finland, site of the 1972 CL World Championships, would not keep his engine running for a full flight. (Apparently something in the team's planning for shipment of U.S. fuel had gone amiss, and the only obtainable fuel for test flying may not have contained nitromethane.) One of the other Stunt Team members also was having this problem, she said, portending disappointing results unless the right kind of fuel was obtained.

We aren't sure how this fuel thing was resolved, but the important thing is that it was. Bob Gieske, Irving, Tex., placed sixth, and Gerald Phelps, Woodhaven, Mich., placed 14th. Together with Werwage's first, this assured the CL Stunt Team World Championships for the U.S.

Russia took all the top honors in CL Team Racing: first, second and third as individuals and first as a team. U.S. individual positions were fourth (Allan Hodgkins/J. McCollum), 14th (Herb Stockton/Don Jehlik) and 15th (James Dunkin/Bill Wright). U.S. Team Racers finished third in the team standings.

U.S. individual placing in CL Speed found Chuck Schuette, Santa Monica, Calif., in sixth; Carl Dodge, Richmond Hts., Ohio, in seventh; and Bob Spahr, Jr., Thousand Oaks, Calif., in 13th. In team scoring, Italy was World Champion and the U.S. finished second.

FF TEAM FINALS, CADDO MILLS, TEX., JULY 1-3

This was the culmination of the two-year competition program to select three-man teams to represent the U.S. in the 1973 Free Flight World Championships (for Wakefield Rubber, FAI Power and Nordic A-2 Glider models) tentatively planned for Austria. The Team Finals, hosted jointly by the Cliff Cloud Climbers of Dallas and the Ft. Worth Planesmen, consisted of 15 rounds--five per day per event--with the three in each event having the highest flight totals being named to the team.

The wind was high during most of the contest--over 20 m.p.h. reported some of the time, with gusts even higher--so that it is very remarkable for first place in FAI Power to be with a perfect string of 15 maxes. That such was possible is a certain indication that the field and its surroundings were good for chasing and retrieving.

FAI Power. Henry Spence, Arlington, Tex., is the one who maxed out to obtain a total of 2700 seconds. In second and third place were Frank Wolff, Massapequa, N.Y., and Tom McLaughlan, Pensacola, Fla., 2688 and 2662 seconds, respectively. Alternate team members, in the event any of the first three should find it necessary to drop out, are Jim Taylor (2656 seconds) and Earl Thompson (2652 seconds).

Wakefield. Frank Parmenter, Friendswood, Tex., and Bob White, Monrovia, Calif., were first and second; both had been members of the 1971 Wakefield team, and White had placed third in the '71 WC. Joining these veterans is a relative "youngster", Jon Davis of Albuquerque, N. Mex. Parmenter had 2561 seconds for first, White 2530 for second, and Davis 2431 for third. Alternates are Fred Pearce (2427 seconds) and Jim Patterson (2424 seconds).

Nordic A-2. Hugh Langevin of Minneapolis, Minn., who also was a '71 team member, placed first with 2315 seconds, followed by Paul Crowley, Warren, Mich., 2222 seconds, and Vince Croghan, Timonium, Md., 2148 seconds. Alternates are George Xenakis (2066 seconds) and O.C. Stewart (2045 seconds).

By special arrangement with publisher this page is produced at the very last minute, just before magazine is printed, to bring you the latest news concerning current Academy Aeronautics events of national significance.

CONTEST CALENDAR

Official Sanctioned Contests of the Academy of Model Aeronautics

SEPT. 2-3—ST. PAUL, MINN. (A) 1st Annual RC Pylon & Scale Meet. Site: University Airport, D. Bruesnaber CD, 6925 Newton Ave., N., St. Paul, Minn. 55430. Sponsor: St. Paul Radio Controllers.

SEPT. 2-3—MEMPHIS, TENN. (AA) Annual Memphis RC Meet. Site: Club Flying Site, R. Roberts CD, 2769 McCulley St., Bartlett, Tenn. 38005. Sponsor: Memphis Radio Control Club.

SEPT. 2-3—CHATTANOOGA, TENN. (A) TVRC RC Meet. Site: Chattanooga. J. Wyatt CD, [redacted] Young Ave., Chattanooga, Tenn. 37405. Sponsor: TVRC.

SEPT. 2-3—ANDERSON, IND. (AA) Madison County RC Contest. Site: Anderson Airport. D. Huffman CD, RR No. 3, Box 350B, Elwood, Ind. 46036. Sponsor: Madison County RC Flyers.

SEPT. 2-3—E. GRANBY, CONN. (A) Nor'East RC Air Races '72. Site: Peterson Farms, B. Williams CD, 347 Southwick Rd., Westfield, Mass. 01085. Sponsor: Northern Conn. RC Club.

SEPT. 2-3—SALT LAKE CITY, UTAH (AA) "Lucky 13th" Annual FF (Cat. I) & CL Model Air Show. Site: Saltair [redacted] Port. F. Haslam CD, 3731 S. 3450 West, Salt Lake City, Utah 84120. Sponsor: Utah State Aeromodelers, Inc.

SEPT. 2-3—GALEVILLE, N.Y. (AAA) SCAMA FF Sweepstakes (Cat. II). Site: Galeville. H. Struck CD, RFD No. 2, Old Lyme, Conn. 06371.

SEPT. 2-4—MONROE, N.C. (AA) MR/CC RC Air Races III. Site: Monroe RC Club. V. Helms CD, 800 Tyvola Rd., Charlotte, N.C. 28210. Sponsor: Monroe RC Club.

SEPT. 2-4 -ANNVILLE, PENNA. KRCS Labor Day Invitational Fly for Fun. Site: Indiantown Gap. W. [redacted] CD, 5 Berkely Dr., Middletown, Penna. 17057. Sponsor: Keystone Radio Control Society, Inc.

SEPT. 3 -LEXINGTON, KY. (AAA) Mid-America CL Championships. Site: Kearney Field. S. Harding CD, 3544 Camelot Rd., Lexington, Ky. 40503. Sponsor: Lexington [redacted] Airplane Club.

SEPT. 3 -CHICAGO, ILL. (AA) IIAA Annual CL Meet. Site: Cumberland [redacted] Irving Park, M. Booker CD, 13711 Dixie Hwy., Harvey, Ill. 60426.

SEPT. 3 -PARKERSBURG, W. VA. (A) Vienna Skysharks Annual RC Contest. Site: Pettyville RC Field, S. Sturm CD, Box 5234, Vienna, W. Va. 26101. Sponsor: Vienna Skysharks Model Airplane Club, Inc.

SEPT. 3—TAFT, CALIF. (A) W.F.F.A. Annual FF Meet. Site: Taft. C.W. Bogart CD, 469 Paulette Pl., LaCanada, Calif. 91011. Sponsor: Southern California Aero Team.

SEPT. 3 -BRIGHTON, WISC. (AA) 12th Annual Illinois Model Aero Club Invitational FAI [redacted] Contest. Site: [redacted] Long Field. P. Sotich CD, 3851 W. 62nd Pl., Chicago, Ill. 60629. Sponsor: Illinois Model Aero Club.

SEPT. 3 -LAKEHURST, N.A.S., N.J. Annual Burlington County RC Club Fun-Fly. Site: U.S. Naval Air Station. H. Clark [redacted], 1130 Monmouth Rd., Mt. Holly, N.J. 08060. Sponsor: Burlington County RC Club.

SEPT. 4—MIDDLESEX, N.J. (AA) Middlesex Modelers 4th Annual CL Contest. Site: Mountain View Park. C. Myers, Jr. CD, [redacted] 127 Lower Kingstown Rd., Pittstown, N.J. 08867. Sponsor: Middlesex Modelers, Inc.

SEPT. 4—SALEM, OHIO RC Short Circuits Club Annual RC Fun-Fly. Site: Quaker City Drag Strip, J. Marshall CD, RD No. 4, Lisbon, Ohio 44432. Sponsor: RC Short Circuits Club.

SEPT. 9-10—DAYTON, OHIO (AAA) Dayton Buzzin' Buzzards CL Jamboree. Site: Municipal Flying Circles. J. Martin CD, 551 Aberdeen, Dayton, Ohio 45419. Sponsor: Dayton Buzzin' Buzzards.

SEPT. 9-10 -ST. JOSEPH, MICH. (AA) Whirlwind 3rd Annual RC Meet. Site: Whirlwind Air Field. C. Ellis CD, 3383 Valley View Dr., St. Joseph, Mich. 49085. Sponsor: Whirlwinds of Southwestern Michigan, Inc.

SEPT. 9-10 -TAFT, CALIF. (AA) Thunderbugs 26th Annual FF Meet (Cat. I). Site: Taft. E. Kelley CD, 4202 W. 172nd St., Torrance, Calif. [redacted]. Sponsor: Thunderbugs Model Airplane Club.

SEPT. 9-10—FT. WAYNE, IND. (AA) 19th Annual Mid-States RC Contest. Site: Smith Field Airport. P. Gieseking CD, 1212 Delta Blvd., Ft. Wayne, Ind. 46805. Sponsor: Fort Wayne Flying Circuits, Inc.

SEPT. 9-10—RHINEBECK, N.Y. (A) World War I RC Jamboree. Site: Olde Rhinebeck Aerodome. G. Bickel CD, Rt. No. 82, Hopewell Jct., N.Y. 12533. Sponsor: Mid-Hudson Radio Control Society, Inc.

SEPT. 9-10—AMARILLO, TEX. (AA) ARKS 12th Annual RC Contest. Site: Amarillo. B. Irwin CD, 3302 Lewis Ln., Amarillo, Tex. 79109. Sponsor: Amarillo Radio Kontrol Society.

SEPT. 10—NORFOLK, VA. (AA) Norfolk Aeromodelers Annual FF & CL Meet. Site: Norfolk, E. Regan CD, 4200 Mayflower Rd., Norfolk, [redacted] 23508. Sponsor: Norfolk Aeromodelers.

SEPT. 10—MIAMI, FLA. (A) [redacted] Mini-[redacted] RC Pylon Races. Site: Miami. W. Schoonard CD, [redacted] Dr., Winter Park, Fla. 32789. Sponsor: R.C.A.C.F.

SEPT. 10—COUNCIL BLUFFS, [redacted] (A) Cobras RC Pylon Meet. Site: Cobra Field. P. Edmunes CD, 4729 Erskine, Apt. 4, Omana, Neb. 78100. Sponsor: Cobras Radio Control Club.

SEPT. 10—ALEDO, ILL. (A) 1st Annual Pylon Races (NMPRA). Site: Mercer County Airport. H. Pohlmann CD, 720 S. Ohio Ave., Davenport, Iowa 52802. Sponsor: Davenport RC Society.

SEPT. 10—LIVINGSTON, N.J. (AA) Livingston Flying Tigers CL Air Meet. Site: G-V Controls-Okner Pkwy. C. Schaefer CD, 109 Madison [redacted], Fanwood, N.J. 07023.

SEPT. 10—ODESSA, TEX. Odessa Semi-Annual RC Fun-Fly. Site: Odessa RC Field. J. Davis CD, 3633 Adams, Odessa, Tex. 79660. Sponsor: Odessa Prop Busters RC Club.

SEPT. 10—FT. LEE, VA. (A) Mid-Virginia RC [redacted] Meet. Site: Ft. [redacted] Airstrip. F. Gregg CD, 12709 Richmond [redacted], Chester, [redacted] 23831. Sponsor: Mid-Virginia RC.

SEPT. 10—WARSAW, IND. (A) 3rd Annual RC Fun-Fly. Site: Warsaw. J. Kay CD, 903 E. Canal, Winona Lake, Ind. 46590. Sponsor: Warsaw Aero Modelers.

SEPT. 10—RIVERSIDE, ILL. (AA) Chicago Scalemasters 4th All-Scale FF, CL & [redacted] Rally. Site: Miller Meadow. D. Platt CD, 104 Talcott Ct., Bolingbrook, Ill. 60439. Sponsor: Chicago Scalemasters.

SEPT. 10—BRIGHTON, [redacted]. (AA) 29th Annual Midwestern States FF Championships. Site: Bong Field. P. Sotich CD, 3851 W. 62nd Pl., Chicago, Ill. 60629. Sponsor: Chicago Aeronuts.

SEPT. 16-17—BOSSIER CITY, LA. (AA) SHARKS Annual RC [redacted] Site: Sharks International. J. Monk CD, 574 Janet Ln., Shreveport, La. 71106.

SEPT. 16-17—S. EL MONTE, CALIF. Air Circus. Site: S. El Monte. J. Garabidian CD, 909 N. 3rd St., Montebello, Calif. 90640. Sponsor: [redacted] Gabriel Valley RC Club.

SEPT. 16-17—MORGAN HILL, CALIF. (A) "Western Front" [redacted] [redacted] Aircraft RC Jamboree. Site: Hill Country Air Museum, M. Groves CD, 791 Nisquality Dr., Sunnyvale, Calif. 94087. Sponsor: Pioneer RC Club.

SEPT. 16-17—TUCSON, ARIZ. (AA) Cholla Choppers Fall CL Invitational. Site: Rodeo Park, F. Townsend CD, 2751 N. Campbell Ave., Tucson, Ariz. 85719. Sponsor: Cholla Choppers.

SEPT. 17—ROCHESTER, N.Y. (AA) United Pylon Racing Circuit RC Meet. Site: Rochester, R. Walder CD, 129 Westmoreland, Rochester, N.Y. 14620. Sponsor: RC Club of Rochester.

SEPT. 17—URBANA, ILL. (A) Midwest All-Stunt CL Meet. Site: [redacted] Airport. J. Fassimpaus CD, 310 E. Benham St., Tolono, Ill. 61880. Sponsor: Champaign-Urbana "Aeronuts."

SEPT. 17—COLUMBUS, OHIO (A) 3rd Annual CORKS RC Meet. Site: CORKS Field, B. Lutz CD, 116 Miller Ave., [redacted] Albany, Ohio 43054. Sponsor: Central Ohio RK Society.

SEPT. 17—OHIO CITY, OHIO. [redacted] Flyers Fly-for-Fun. Site: Club Field. J. Acheson CD, P.O. Box 181, [redacted], [redacted] 45898. Sponsor: SHOO Flyers M.A.C., Inc.

SEPT. 17—BLAINE, MINN. (A) Minneapolis Model Aero [redacted] 12th Annual Little FF (Cat. II) Internats. Site: Hantges Sod Farm, D. Monson CD, 131 W. Wentworth, [redacted], St. Paul, Minn. 55118. Sponsor: Minneapolis Model Aero Club.

[redacted]T. 17—NEW YORK, N.Y. (AA) Assoc. M.A.C. of Greater N.Y. 12th Annual CL [redacted] Site: Flushing [redacted] Park. W. Boss CD, 77-06 [redacted] St., New Hyde Park, N.Y. 11040.

SEPT. 17—COUNCIL BLUFFS, IOWA (AA) Cobras Pattern RC Meet. Site: Cobras Field. J. Simpson CD, 2736 Ellsworth, Omaha, Neb. 68123. Sponsor: Cobras RC Club.

SEPT. 17—ALBANY, ORE. (A) Northwest Old Timers Championships. Site: Parker Field. J. Shafer CD, P. O. Box 322, Dallas, Ore. 97338. Sponsor: Willamette Modelers Club, Inc.

SEPT. 17—EAST MEADOW, N.Y. (AA) L.I.D.S. Invitational RC Contest. Site: Mitchel Field. T. Felcco CD, 3989 Florence Rd., Seaford, N.Y. 11783. Sponsor: Long Island Drone Society.

SEPT. 17—COLLEGE PARK, MD. (A) Summer Stunt CL [redacted] Site: Paint Branch Flying Field, R. Greene CD, 5902 Cherrywood Terr., No. 101, Greenbelt, Md. 20770. Sponsor: Sky Lancers of Washington, D.C.

SEPT. 17—WESTFIELD, IND. (A) Hamilton County Fly-for-Fun. Site: [redacted]d. H. Vandiver CD, [redacted] Wilson Dr., Carmel, Ind. 46032. Sponsor: Hamilton County Flying [redacted]ers.

SEPT. 17—FT. WORTH, TEX. (A) RC Pylon Formula I Meet. Site: Ft. Worth. G. Ware CD, 609 S. Lake, Ft. Worth, Tex. 76104. Sponsor: Fort Worth Thunderbirds.

SEPT. 17—WICHITA, KANS. (AA) 6th Annual Wichihawks Fally FF & CL Rally. Site: Beech Field. L. Woolard CD, 1558 N. Battin, Wichita, Kans. 67208. Sponsor: Wichihawks.

SEPT. 17—LAKEHURST, N.J. (A) Ocean County Fledgling RC Fly-Off. Site: Lakehurst N.A.S. J. Birgel CD, 229 VanSant Ave., Island Hts., N.J. 08732.

SEPT. 17—PLYMOUTH, MICH. (A) Midwest E.C.S.S. RC Meet. Site: Plymouth State Training Home. D. Burt CD, 3048 Central St., Evanston, Ill. 60201. Sponsor: Silent Order of Aeromodeling by Radio.

SEPT. 23-24—DENVER, COLO. (AA) 7th Annual Great West Rocky Mountain FF (Cat. II) Championships. Site: E. Colfax Air Park, E. Collins CD, 4318 E. Utah [redacted], Denver, Colo. 80222. Sponsor: Magnificent Mountain Man.

SEPT. 23-24—MEMPHIS, TENN. (AA) Memphis Prop Busters Annual Control Meet. Site: McKellar Park, T. Cimino CD, 981 June Rd., Memphis, Tenn. 38117.

SEPT. 23-24—HUNTSVILLE, ALA. RC Masters '72. Site: [redacted] HSVL Airport. C. Schofield CD, 2709 Briarwood Dr., Huntsville, Ala. 35801. Sponsor: Rocket City Radio Controllers, Inc.

SEPT. 23-24—FRESNO, CALIF. (AA) Fresno's [redacted] FF (Cat. I) Annual Meet. Site: Near Kerman. F. Ginder, Jr. CD, 5740 E. Ashlan, Fresno, Calif. 93727. Sponsor: Fresno Gas Model Club.

SEPT. 23-24—TRACY, CALIF. (A) Western States RC Pylon Championships. Site: Municipal Airport, R. Morse CD, 3351 Pruneridge Ave., Santa Clara, Calif. 95051. Sponsor: Pioneer RC Club.

SEPT. 23-24—KNOXVILLE, TENN. E.T.R.C. Fun-Fly. Site: Knoxville, R. Rhyne, Sr. CD, Route 4, Clinton, Tenn. 37716. Sponsor: East Tenn. RC Society.

SEPT. 24—ROWLEY, MASS. 1972 Cape Ann Fly-for-Fun. Site: Cape Ann RC Field. R. Geertiner CD, 9 Brookbridge Rd., Peabody, Mass. 01960. Sponsor: Cape Ann RC [redacted] Club.

[redacted]. 24—E. BERLIN, PENNA. YARC 2nd Annual RC Fun-Fly. Site: YARC Field. K. Reber CD, Mounted Route, Mt. Holly Springs, Penna. 17065. Sponsor: York Area RC Club.

SEPT. 24—QUEENS, N.Y. (A) Cash [redacted] Forest Park CL [redacted]. Site: Flushing Meadow Park, R. Sobrino CD, 87-26 88th St., Woodhaven, N.Y. 11421.

SEPT. 24—ROCKAWAY, N.Y. (A) 1972 East Coast RC Scale Championships. Site: Reis Park, J. D'Amico CD, 9224 Rost Pl., Brooklyn, N.Y. 11236. Sponsor: Pennsylvania Avenue RC Society of N.Y.

SEPT. 24—BRIDGEWATER, MASS. Fun-Fly. Site: Bridgewater. S. Rizzoto CD, 30 N. Lillian St., Randolph, Mass. [redacted]. Sponsor: South Shore RC Club.

SEPT. 24—BRIGHTON, WISC. (AA) 10th Annual Chicago Aeronuts Fall Old Timers' FF (Cat. II) Contest. Site: Bong Field. P. Sotich CD, 3851 W. 62nd Pl., Chicago, Ill. 60629. Sponsor: Chicago Aeronuts.

SEPT. 24—WACO, TEX. (A) 4th Annual H.O.T., M.A.C. Meet. Site: Waco. C. Horton CD, 916 Wedgewood, Waco, Tex. 76710. Sponsor: Heart O'Texas RC Miniature Aircraft Club.

SEPT. 30-OCT. 1—E. GRANBY, CONN. (AA) N.C.R.C.C. Annual [redacted] Pattern Meet. Site: E. Granby. G. Sawn CD, [redacted] Audrey Ln., Enfield, Conn. 06082. Sponsor: Northern Connecticut RC Club.

SEPT. 30-OCT. 1—ELMIRA, N.Y. (A) National RC Soaring Contest. Site: Harris Hill, R. Miller CD, 22 Kings Cir., Corning, N.Y. 14830. Sponsor: The Flying Sparks, Inc.

SEPT. 30-OCT. 1—JAMESTOWN, N.Y. (AA) United Pylon Racing Circuit [redacted] Championships. Site: Hartfield, W. Johnson CD, 153 Hallock St., Jamestown, N.Y. 14701.

SEPT. 30-OCT. 1—MONROE, N.C. (AA) N. Carolina State [redacted] Meet. Site: Monroe. D. Pearce CD, 1005 Ainsworth Ct., Greensboro, N.C. 27410.

OCT. 1—MENTOR, OHIO Quarter Midget World Championships. Site: Tyler Blvd. R. Penko CD, 21151 Westport Ave., Euclid, Ohio 44094. Sponsor: Mentor Area RC Society.

OCT. 1—VALLEY PARK, MO. (A) United States Model Aerobatic CL Championships. Site: [redacted] Park, T. Niebuhr CD, 1170 S. Florissant Rd., Florissant, Mo. 63031. Sponsor: St. Louis Yellow Jackets.

OCT. 1—LINCOLN PARK, N.J. (A) 14th [redacted] CL Model Air Show. Site: G.S.C.B. Club Field. K. Purzycki CD, 273 Marcella Rd., [redacted] Parsippany, N.J. 07054. Sponsor: Garden State Circle Burners Inc.

OCT. 1—LAKEHURST, N.J. (AA) Central Jersey RC [redacted] 1972 Eastern States RC Championships. Site: Lakehurst Naval Air Station. L. Shulman CD, 1114 Raritan Rd., Clark, N.J. 07066. Sponsor: Central Jersey RC Club.

OCT. 1—DAYTON, OHIO (AA) Dayton [redacted] 1/2A & [redacted] CL Contest. Site: Municipal Flying Field. K. Trostle CD, [redacted] Leawood Dr., Dayton, Ohio 45424. Sponsor: Dayton Buzzin' Buzzards.

OCT. 1—ALBANY, ORE. (A) 3rd Annual Silence Please [redacted] Meet (Cat I). Site: Parker Field. [redacted] Stalick CD, 1120 Shady Ln., Albany, Ore. 97321. Sponsor: Willamette Modelers Club, Inc.

OCT. 1—OKLAHOMA CITY, OKLA. (AA) Controllners Fall CL Rally. Site: 5300 N. Broadway Ext. M. McGee CD, 904 N. Harris, Apt. D, Oklahoma City, Okla. 73107. Sponsor: Oklahoma City Controllners.

OCT. 1—RICHMOND, VA. (AA) Brainbusters Fall FF Meet (Cat. II). Site: Curles Neck Dairy Farm. B. Champine CD, P.O. Box 6213, Newport News, Va. [redacted] Sponsor: Brainbusters Model Club.

OCT. 1—MESQUITE, TEX. (A) Golden Triangle Annual A-B Pattern & Scale RC Meet. Site: Samuels Park East, B. O'Steen CD, 1506 Marie Terr., Arlington, Tex. 76010. Sponsor: [redacted] Triangle RC Club.

OCT. 7-8—ALBUQUERQUE, N.M. (AA) SWAT 8th Annual FF (Cat. I) Contest. Site: Boys' Academy. J. Bicknell CD, 12329 Princess Jean, N.E., Albuquerque, N.M. 87112. Sponsor: South West Aero Team.

OCT. 7-8—S. EL MONTE, CALIF. (A) San Gabriel Annual [redacted] Pattern Contest. Site: S. El Monte. J. Garabidian CD, 909 N. 3rd St., Montebello, Calif. 90640. Sponsor: San Gabriel Valley RC Club.

OCT. 7-8—FISKDALE, MASS. (AA) 7th Annual N.E. Hydro Radioplane Championships. Site: Brimfield Dam. J. Ross CD, 19 Sterling Dr., Dover, Mass. 02030. Sponsor: New England RC Modelers, Inc.

OCT. 7-8—VAN NUYS, CALIF. (A) N.A.R. Flightmasters 23rd Annual FF Scale Contest. Site: Van Nuys Basin. J. Kusik CD, 9172 Wilhelm Cir., Huntington Bch., Calif. 92646. Sponsor: N.A.R. Flightmasters.

OCT. 7-8 -SPOKANE, WASH. (A) Octoberfest Fun-Fly & RC Pattern. Site: Barons Field. C. Martin CD, 2906 N. 5th St., Coeur d'Alene, Idaho 83814. Sponsor: Barons Model Club.

OCT. 7-8—WALLKILL, N.Y. (AA) Sky-Scrapers International FF Challenge. Site: Galeville Army A.F. W. Dunwoody CD, [redacted] Ft. Salonga Rd., Northport, N.Y. 11768. Sponsor: Sky-Scrapers.

OCT. 8—SOUTHFIELD, MICH. (A) Cloudbusters Annual FF Scale Meet. Site: Southfield, R. Duenz CD, 14645 Stahelin, Detroit, Mich. 48223.

OCT. 8—LINCOLN PARK, N.J. (AA) 14th Annual CL Model Air Show-2nd Half. Site: G.S.C.B Club Field. E. Miska, Jr. CD, 418 Clifton [redacted], Clifton, N.J. 07013. Sponsor: Garden State Circle Burners, Inc.

OCT. 8—HUNTSVILLE, ALA. (AA) MACH [redacted] Timer and FAI FF Contest. Site: Old Huntsville Airport. L. Baker, Jr. CD, 701 Esslinger, Huntsville, Ala. 35802. Sponsor: Model Airplane Club of Huntsville.

OCT. 8—DETROIT, MICH. (AA) Fall CL Internationals. [redacted] Rouge Park. J. Lucas CD, 20463 Ardmore, Detroit, Mich. 48235. Sponsor: Strathmoor Model Club.

OCT. 14-15—LAS VEGAS, NEV. (AA) L.V.R.C. Annual RC Meet. Site: Tule Springs Park, R. Mearns CD, 5412 Holmby Ave., Las Vegas, Nev. 89102.

OCT. 14-15—NEW ORLEANS, LA. (AA) 11th Annual Crescent City RC Meet. Site: Club Flying Field. A. Wiltz CD, 3231 47th St., Metairie, La. 70001.

OCT. 15—FORTH WORTH, TEX. (AA) The Fort Worth Planesman Fall Annual FF Meet. Site: To be Determined. W. McCormick CD, 4612 Pleasant, Ft. Worth, Tex. 76115. Sponsor: The Fort Worth Planesman.

OCT. 15—HUNTSVILLE, ALA. (A) RC/RC Soaring Meet. Site: Old Airport, C. Schofield CD, 2709 Briarwood Dr., Huntsville, Ala. 35801. Sponsor: Rocket City Radio Controllers, Inc.

OCT. 15—FT. LEWIS, WASH. (AA) 3rd Annual FF Power Bash (Cat. I). Site: Harts Lake Prairie, H. Smith CD, 1417 N.W. 191st St., Seattle, Wash. 98177. Sponsor: Boeing Charter Hawks.

OCT. 15—WATERMILL, N.Y. Suffolk Falcon's Annual Water Mill Meet. Site: Watermill. [redacted] Caplan CD, 21 Oneida Ave., Centereach, N.Y. 11720. Sponsor: Suffolk Falcons.

OCT. 15—SALEM, OHIO (A) RC Short Circuits Club RC Soaring Contest. Site: Quaker City Drag Strip, B. Marshall CD, RD No. 5, Lisbon, Ohio 44432. Sponsor: RC Short Circuits Club.

OCT. 21-22—MONROE, N.C. (AA) MRCC RC Air Races IV. [redacted] Monroe RC Club, V. Helms CD, 800 Tyvola Rd., Charlotte, N.C. 28210. Sponsor: Monroe RC Club.

OCT. 21-22—HOMESTEAD, FLA. (A) AMPS RC 2nd Annual Fly-In. Site: AMPS Field, R. Hendricks CD, 11742 SW 176 Terr., Miami, Fla. 33157. Sponsor: Aero-Modelers of Perrine.

OCT. 21-22—VENTURA, CALIF. (AA) Ventura County Comets RC Pattern Contest. Site: Ventura, R. Lake CD, 1033 Red Oak [redacted], Camarillo, Calif. 93010. Sponsor: Ventura County Comets.

OCT. 21-22—ABILENE, TEX. (A) Abilene RC Pattern Fly. Site: Snabee Park-Ft. Phantom Lake, R. Howard CD, 42[redacted] N. First St., Abilene, Tex. 79603. Sponsor: Abilene RC Society.

OCT. 22—BRIDGEWATER, MASS. Fun-Fly. Site: Bridgewater, J. Ennis CD, 165 Grafton St., Brockton, Mass. 02401. Sponsor: South Shore RC Club.

OCT. 28-29—OKLAHOMA CITY, OKLA. Oklahoma Model & Hobby Fair. Site: Oklahoma State Fair Grounds, D. Armor CD, 7308 [redacted] Western, Duncan, Okla. 73116. Sponsor: TORKS.

OCT. 29—F RESNO, CALIF. (A) Fresno Monthly FF Meet (Cat. I). Site: Near Kerman, F. Ginder, Jr. CD, 5740 E. Ashlan, Fresno, Calif. 93727. Sponsor: Fresno Gas Model Club.

OCT. 29—VALKARIA, FLA. (A) Florida Miniature Pylon RC Races. Site: Valkaria. W. Schoonard CD, 2080 Sharon Dr., Winter Park, Fla. 32789. Sponsor: R.C.A.C.F.

Chartered Club officers who receive the AMA Monthly Mailing found out in August what was August's big modeling news. Did you? If not, ask you officers why not!

AMA OFFICER DIRECTORY

The most recent complete directory was published in the August AAM, p. 103.


BOOMER McBRAGG!
BOB GODDEN
THIS IS JOHN CAMSHAFT SWIZZLE FOR GRIMEX-AND WITH ME TODAY FOR OUR GRIMEX TEST IS MR. McBRAGG AND DEADLY DICK!
STRAPPED TO DICK'S FAMOUS SOIL PENETRATOR 29 IS A GRIMEX WATCH! SHOCKPROOF! WATERPROOF AND JUST LISTEN TO THAT GRIMEX TICK!!
NOW FOR THE TEST!!
LADIES AND GENTLEMEN DEADLY DICK WHO IS FAMOUS FOR HIS MANY SHORT FLIGHTS, HAS TAKEN OFF!
MR. McBRAGG HAS ASSURED ME THAT DEADLY DICK HAS NEVER YET FAILED TO CRASH —
-BUT IT LOOKS LIKE THIS TIME THAT— NO! NO THERE HE GOES
RRRRRRRRRRRRRREEEEEE
KEERASH!
OH LADIES AND GENTLEMEN, THE SMOKING CRATER IS SIMPLY AWESOME, BUT THE GRIMEX IS STILL TICKING! I CAN HEAR IT...
McBRAGG IS CLIMBING DOWN INTO THE CRATER TO RETRIEVE OUR FAMOUS GRIMEX WATCH -
WELL MR. SWIZZLE, YOUR GRIMEX IS BUSTED - BUT THE GALLOPING GHOST SYSTEM IS STILL TICKING LIKE CRAZY!
TIK TIK TIK TIK A TIK

ENGINEERED AND DEVELOPED UNDER THE PERSONAL DIRECTION OF DAVID D. GRAY, WELL-KNOWN U.S. RADIO CONTROLLED MODEL HELICOPTER BUILDER AND FLYER.

designed and manufactured by **DU-BRO PRODUCTS INCORPORATED** wauconda, illinois 60084 U.S.A.

"DU-BRO WHIRLYBIRD 505"® **RADIO CONTROLLED** "QUICK ASSEMBLY" HELICOPTER KIT

MAIN ROTOR SPAN	46½"
MAIN ROTOR CHORD	2½"
TAIL ROTOR DIAMETER	7"
TAIL ROTOR BLADE CHORD	⅝"
OVER-ALL LENGTH	37⅝"
MAXIMUM FUSELAGE DEPTH	6"
OVERALL HEIGHT	16"
POWER . . . KB OR OS MAX.	.40
CONTROL SYSTEM	4 SMALL SERVOS
FUEL TANK CAPACITY	3 OUNCES
FLYING WEIGHT	4 LBS.
APPROXIMATE DURATION	8 MIN.

MAIN FRAME ASSEMBLY PARTS ARE PRECISION CUT HARD WOODS WITH A RUGGED FIBERGLASS TAIL BOOM. THE CLEAR PLASTIC CANOPY AND FOUR FUSELAGE SECTIONS ARE ALL REMOVABLE FOR EASY ACCESS TO RC GEAR AND LINKAGES. MAIN ROTORS ARE ¼" BALSA WITH PLYWOOD REINFORCING PLATES. LANDING SKIDS ARE BRASS, SUPPORTED BY STURDY STEEL STRUTS. FUEL TANK/ENGINE SUPPORT UNITS ARE CAREFULLY MACHINED ALUMINUM FOR LASTING SERVICE. MACHINED DELRIN, WEAR RESISTANT SWASH PLATES FOR ACCURATE ROTOR PITCH CONTROL. PRECISION GROUND STEEL ROTOR SHAFT RUNS IN BALL BEARINGS. ALSO INCLUDED IS AN ENGINE COUNTER WEIGHT, MACHINED TO GIVE THE APPEARANCE OF A TWO CYLINDER ENGINE WHEN MOUNTED. MANY SUPERBLY MACHINED PARTS AND ALL LINKAGE INCLUDED.

☆ "DU-BRO WHIRLYBIRD 505"® IS THE END RESULT OF THOUSANDS OF "RESEARCH AND DEVELOPMENT" HOURS, MANY DESIGN CHANGES AND COUNTLESS FLIGHT TESTS... DU-BRO PRODUCTS INC. HAS SPARED NO EXPENSE TO MAKE R.C. HELICOPTER FLYING POSSIBLE FOR EVERYONE AT NOMINAL COST. A NEW R.C. EXPERIENCE, A NEW R.C. ACTIVITY CAN BE YOURS WITH THIS REMARKABLE AIRCRAFT. AVERAGE ASSEMBLY TIME REQUIRED IS A MERE 8 HOURS. *NO. 505 $125.00

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